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DATE: 04/27/04 TIME: 1055 a.m. / p.m.

FROM: Dorothy S. Morse, Esq.  
515 Park Drive, N.W.  
Bradenton, FL 34209-1847  
phone: (941) 747-4313 / fax: (941) 748-4008

SEND TO: Carl Friedman, Supervisor  
U.S. Patent & Trademark Office  
Phone: 703-308-0839  
Fax: 703-872-9306

TOTAL PAGES SENT: 64 (including cover sheet)

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COMMENTS:

TO - Examiner Friedman, Supervisor

Per my telephone conversation with you, enclosed is a Petition to Withdrawn a Holding of Abandonment since the applicants did file an Office Action response before the 6-month statutory deadline allowed for response and the application was never abandoned. Contact me if you have any questions.

FOR -

Applicant: Timothy M. Bronson and Brian V. Fiala  
Serial Number: 10/044,108  
Date Filed: January 11, 2002  
Title: Valley Truss Uplift Resistance Strap With Wedge and Method of Use  
Examiner: Christy M. Green  
Group Art Unit: 3635

NOTE: THE INFORMATION CONTAINED IN THIS FACSIMILIE TRANSMISSION IS  
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APR 27 2004

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

OFFICIAL

Applicant: Timothy M. Bronson + Brian V. Fiala  
Serial Number: 10/044,108  
Date Filed: January 11, 2002  
Title: Valley Truss Uplift Resistance Strap with Wedge and Method of Use  
Examiner: Christy M. Green  
Group Art Unit: 3635

April 27, 2004

Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Dear Commissioner:

Enclosed for filing please find a Petition for Withdrawal of a Holding of Abandonment, since a Notice of Abandonment was issued in spite of the fact that a response was filed by U.S. Express Mail on February 10, 2004 and that date was within the six-month statutory deadline allowed for response to the September 10, 2003 non-final Office Action. A two-month Petition for Extension of Time under 37 CFR 1.136(a) was included with the February 10, 2004 response, along with a check for the \$210 small entity extension fee, which was credited to the USPTO on February 20, 2004. The name of the inventors, the name of the Examiner, the title of the invention, the group art unit, the filing date, and the application's serial number were all clearly marked on the paperwork and late fee check.

I hereby certify that this correspondence, the Petition, and a copy of the response filed on February 10, 2004 are being sent to the Commissioner for Patents, U.S. Patent & Trademark Office, via facsimile transmission, on April 27, 2004 at 1055 (am) / pm to fax number 703-872-9306

Respectfully submitted and faxed by:



Dorothy S. Morse  
U.S. Patent and Trademark Office  
Registration Number: 38, 977

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APR 27 2004

**OFFICIAL**

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants: Timothy M. Bronson + Brian V. Fiala  
Serial Number: 10/044,108  
Date Filed: January 11, 2002  
Title: Valley Truss Uplift Resistance Strap with Wedge and Method of Use  
Examiner: Christy M. Green  
Group Art Unit: 3635

PETITION FOR WITHDRAWAL OF A HOLDING OF ABANDONMENT

April 27, 2004

Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Dear Commissioner:

This communication is a response to a notice of Abandonment dated April 20, 2004 and issued by Examiner Christy Marie Green in the above-referenced utility patent application of Timothy M. Bronson and Brian V. Fiala. The Petition herein requests a withdrawal of the holding of abandonment, as the application was never abandoned. On February 10, 2004, the applicants filed an Office Action response via the U.S. Express Mail delivery service of the U.S. Post Office, only five months after the September 10, 2003 non-final Office Action was mailed, and well within the 6-month statutory period allowed for response.

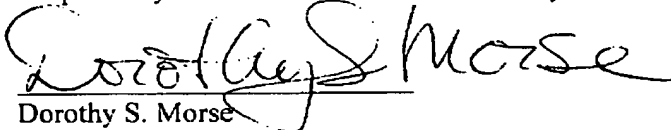
Submitted as proof that the applicants filed an Office Action response on February 10, 2004, the following are enclosed:

1. copy of a Express Mail receipt dated February 10, 2004 showing the U.S. Patent & Trademark Office as the addressee

2. copy of a page from the U.S. Post Office website showing that the envelope with that same Express Mail receipt was delivered to the U.S. Patent Office on February 11, 2004
3. copy of the transmittal letter from the Office Action response filed on February 10, 2004 displaying the same Express Mail receipt number
4. copy of the check used to pay the small entity 2-month extension fee of \$210 under 35 USC 1.136(a) and showing proper application information recorded on it
5. copy of a bank statement page showing that the \$210 extension fee was deposited by the USPTO on February 20, 2004

The applicants also enclose a copy of the Office Action response filed on February 10, 2004 and request that the Petition be expeditiously granted so that the accompanying Office Action response from February 10, 2004 can be reviewed.

Respectfully submitted on behalf of Timothy M. Bronson and Brian V. Fiala by:

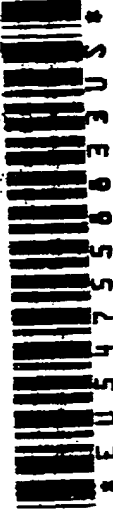


Dorothy S. Morse  
515 Park Drive, N.W.  
Bradenton, FL 34209-1847  
(941) 747-4313 (phone)/ (941) 748-4008 (fax)  
U.S. Patent and Trademark Office Registration Number: 38,977



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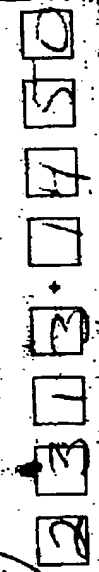
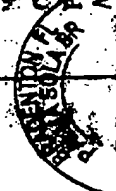
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5:17 PM	5:17 PM	5:17 PM
<input checked="" type="checkbox"/> Add Weight	<input checked="" type="checkbox"/> Add Weight	<input checked="" type="checkbox"/> Add Weight
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Bradenbury S. Morda, Esq.  
515 Park Drive, NW  
Bradenbury, VA 22317-1450

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- ENROUTE, February 10, 2004, 6:12 pm, SARASOTA, FL 34260
- ACCEPTANCE, February 10, 2004, 5:00 pm, BRADENTON, FL 34209

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: Timothy M. Bronson + Brian V. Fiala  
 Serial Number: 10/044,108  
 Date Filed: January 11, 2002  
 Title: Valley Truss Uplift Resistance Strap with Wedge and Method of Use  
 Examiner: Christy M. Green  
 Group Art Unit: 3635

February 10, 2004

Commissioner for Patents  
 P.O. Box 1450  
 Alexandria, VA 22313-1450

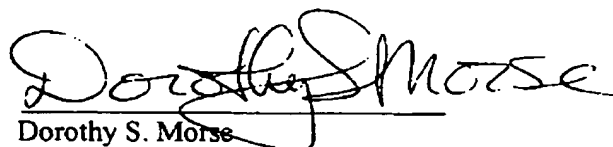
Dear Commissioner:

Enclosed for filing please find a response to a non-final Office Action dated September 10, 2003. A shortened statutory period of three (3) months was set for response. A two-month Petition for Extension of Time under 37 CFR 1.136(a) is also enclosed with a check for the \$210 small entity extension fee.

I hereby certify that this correspondence, the response with its drawing sheets and amendments, the Petition, and the Extension Filing Fee, are being deposited with the United States Post Office for Express Mail Delivery "to addressee" in an envelope addressed to the Commissioner for Patents, U.S. Patent & Trademark Office, P.O. Box 1450, Alexandria, VA, 22313-1450, on February 10, 2004.

Express Mail Identification Number: EU547558833US

Respectfully submitted and mailed by:



Dorothy S. Morse  
 U.S. Patent and Trademark Office  
 Registration Number: 38, 977

1197

83-1372/631 004

DOROTHY S MORSE ATTORNEY AT LAW

IOTA ACCOUNT

515 PARK DR NW  
BRADENTON, FL 34209-1847

Feb 10, 2004

PAY TO THE ORDER OF Director of Patents & Trademarks \$ 210.00

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AMERICAN INVENTORS - Timothy M. Bronson + Brian V. Fiala  
BANK # 10/044,108 File Date - 01/11/02  
BRADENTON FLORIDA 24 Hour Information Service 941-795-3833  
with wedge + method of use

FOR 2 month - Extension fee

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Dorothy Morse



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Page 3

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NAME: Dorothy S. Morse, Atty. At Law ACCOUNT NO. 104 99999	1063
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Gold Bank MEM. INST. N. 1019 BRADENTON, FL 34219	
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2/2/2004	99999 \$1,800.00

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My Bank Paid Late Fee of \$210 to USPTO on 02/20/04

Branson + Fida - Serial # 10/044,108  
Examiner - Christy Marie Green

The remaining pages  
are from the  
Office Action  
response filed  
02/10/04

D. Morse  
04/26/04

PTO/SB/22 (08-03)

Approved for use through 7/31/2006. OMB 0651-0031

U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

Under the paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

<b>PETITION FOR EXTENSION OF TIME UNDER 37 CFR 1.136(a)</b>		Docket Number (Optional)	
In re Application of <u>TIMOTHY M. BRANSON + BRIAN V. FALA</u>			
Application Number <u>10/044,108</u>		Filed <u>Jan. 11, 2002</u>	
For <u>VALLEY TRUSS UPLIFT RESISTANCE STRAP WITH WEDGE HEAD METHOD OF USE</u>			
Art Unit <u>3635</u>		Examiner <u>CHRISTY M. GREEN</u>	

This is a request under the provisions of 37 CFR 1.136(a) to extend the period for filing a reply in the above identified application.

The requested extension and appropriate non-small-entity fee are as follows (check time period desired):

☐ One month (37 CFR 1.17(a)(1)) \$ \_\_\_\_\_

☒ Two months (37 CFR 1.17(a)(2)) \$ 420

☐ Three months (37 CFR 1.17(a)(3)) \$ \_\_\_\_\_

☐ Four months (37 CFR 1.17(a)(4)) \$ \_\_\_\_\_

☐ Five months (37 CFR 1.17(a)(5)) \$ \_\_\_\_\_

☒ Applicant claims small entity status. See 37 CFR 1.27. Therefore, the fee amount shown above is reduced by one-half, and the resulting fee is: \$ 210.

☒ A check in the amount of the fee is enclosed.

☐ Payment by credit card. Form PTO-2038 is attached.

☐ The Director has already been authorized to charge fees in this application to a Deposit Account.

☐ The Director is hereby authorized to charge any fees which may be required, or credit any overpayment, to Deposit Account Number \_\_\_\_\_.

I have enclosed a duplicate copy of this sheet.

I am the ☐ applicant/inventor.

☐ assignee of record of the entire interest. See 37 CFR 3.71.  
Statement under 37 CFR 3.73(b) is enclosed (Form PTO/SB/96).

☒ attorney or agent of record. Registration Number 38,977

☐ attorney or agent under 37 CFR 1.34(a).  
Registration number if acting under 37 CFR 1.34(a) \_\_\_\_\_

**WARNING:** Information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on PTO-2038.

02-10-04  
Date

941-747-4313  
Telephone Number

Dorothy S. Morse  
Signature

DOROTHY S. MORSE  
Typed or printed name

NOTE: Signatures of all the inventors or assignees of record of the entire interest or their representative(s) are required. Submit multiple forms if more than one signature is required, see below.

☐ Total of \_\_\_\_\_ forms are submitted.

This collection of information is required by 37 CFR 1.136(a). The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 6 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: Timothy M. Bronson + Brian V. Fiala  
 Serial Number: 10/044,108  
 Date Filed: January 11, 2002  
 Title: Valley Truss Uplift Resistance Strap with Wedge and Method of Use  
 Examiner: Christy M. Green  
 Group Art Unit: 3635

February 10, 2004

Commissioner for Patents  
 P.O. Box 1450  
 Alexandria, VA 22313-1450

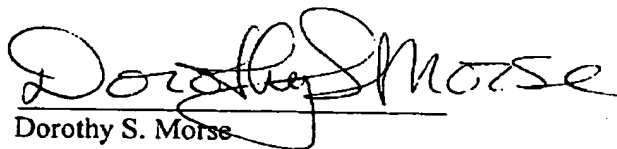
Dear Commissioner:

Enclosed for filing please find a response to a non-final Office Action dated September 10, 2003. A shortened statutory period of three (3) months was set for response. A two-month Petition for Extension of Time under 37 CFR 1.136(a) is also enclosed with a check for the \$210 small entity extension fee.

I hereby certify that this correspondence, the response with its drawing sheets and amendments, the Petition, and the Extension Filing Fee, are being deposited with the United States Post Office for Express Mail Delivery "to addressee" in an envelope addressed to the Commissioner for Patents, U.S. Patent & Trademark Office, P.O. Box 1450, Alexandria, VA, 22313-1450, on February 10, 2004.

Express Mail Identification Number: EU547558833US

Respectfully submitted and mailed by:

  
 Dorothy S. Morse  
 U.S. Patent and Trademark Office  
 Registration Number: 38,977

## IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants: Timothy M. Bronson + Brian V. Fiala  
Serial Number: 10/044,108  
Date Filed: January 11, 2002  
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Examiner: Christy M. Green  
Group Art Unit: 3635

February 10, 2004

Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Dear Commissioner:

This communication is a response to a non-final Office Action dated September 10, 2003 and provides a listing of claims that has each claim marked with its current status and proposed amendments, if any. It also provides two replacement figures that the applicants believe will assist in a better understanding of their invention by a reader, as well as corresponding amendments to the Specification for those replacement figures. The response further shows the language that the applicants propose for addition to their claims and Specification marked with underlining, and text that the applicants would like to have deleted from their claims and Specification shown with 'strike-through' markings. The applicants believe that no new matter has been added as a result of the proposed amendments herein to their claims and Specification, or the two replacement figures.

## DRAWING AMENDMENTS

Two replacement figures are proposed in the instant Office Action response. First, a new Fig. 20 is proposed. During a telephone interview with Examiner Green, the applicants determined that the valley trusses in the original Fig. 20 were inconsistently identified and also realized that the positioning of multiple present invention devices in Fig. 20 made them difficult to view. As a result, one of the applicants has redrawn Fig. 20 with a clarified identification of the valley trusses therein and the needed positioning of the present invention device relative to each valley truss. The applicants believe that no new matter has been added by the changes made to Fig. 20. Further, since the new Fig. 20 more accurately identifies the usable position of the present invention relative to each valley truss used, the applicants believe that the original Fig. 21 no longer adds any new information about valley trusses or the present invention. Thus, since the old Fig. 21 has become merely duplicative, the applicants propose that the original Fig. 21 be deleted. In addition, the applicants provide herein a new illustration intended to replace the Fig. 22 they proposed in their June 20, 2003 response to an Election/Restriction requirement. Further, since the original Fig. 21 has been canceled, the replacement illustration for the previously proposed Fig. 22 has been given the marking of Fig. 21 ('new' Fig. 21 for purposes of discussion herein). The replacement illustration marked as 'new' Fig. 21 is different from the Fig. 22 it replaces in that its bottom surface is now shown as being planar (not arcuate) so that it more closely resembles the embodiments of the present invention shown in original Figs. 1, 15, and 17-19. The 'new' Fig. 21 also shows web member 10 and base member 6 having a greater thickness than is shown in Figs. 15 and 19, however, the thickness of web member 10 and base member 6 was not identified in the original disclosure as being a critical dimension. Although 'new' Fig. 21 represents a molded embodiment of the present invention in which its wedge 8 shares a common surface with the lower end of web member 10, thus making a closed wedge with three perimeter sides when viewed in cross-section that does not rely on any portion of the construction material to which it will become attached to for its third perimeter side, the

applicants believe that no new matter has been added thereby since page 17, lines 6-10 of the original disclosure discuss a molded embodiment. The applicants argue that the Examiner should allow this 'new' Fig. 21 to be a part of their allowed disclosure, as it is the finished shape of their valley truss strap and the manner in which it is used that are novel, irrespective of the method used to create that shape. Further, 'new' Fig. 21 is consistent with the elected Group 4 wherein the base member does not extend beyond the tapered end of the wedge. Other U.S. Patents, such as U.S. Patent 4,455,791 to Elko (1984), which in the discussion of its Fig. 4 discloses that its gutter's cover can be preformed out of plastic or metal, as well as U.S. Patent 6,516,498 to La Coy (2003) for a clamp that discloses manufacture out of plastic or metal, support the applicant's argument that different materials, to include plastics and flat steel, can be contemplated as alternative options for the construction of the embodiments in a single patentable invention. Therefore, the applicants respectfully argue that the Examiner herein should follow precedent and allow proposed 'new' Fig. 21 to become a part of the instant patent application disclosure. Thus, the applicants request reconsideration and clarification by the Examiner on this issue.

## SPECIFICATION AMENDMENTS

The Specification is being amended herein only to add language corresponding to the drawing changes proposed hereinabove, such as deletion of the original Fig. 21 and substitution of a replacement sheet for the previously proposed Fig. 22. Marked-up and clean copies of the changes made to the Specification have been included as a part of this Office Action response, with added language being shown with 'underline' markings and deleted language shown with 'strike-through' markings. As previously discussed hereinabove, the applicants believe that no new matter has been added by the changes to the Specification proposed herein



#### CLAIM AMENDMENTS

Claims 1-5, 7, 9-14, and 16-20 are currently pending and have been rejected by the Examiner in the pending Office Action. The applicants have amended their claims to distinguish the invention they disclose from the Leavens invention and the other prior art cited by their Examiner, and included the cancellation of some original claims. A listing of the current status of all claims has been provided with this response, with amendments thereto being identified by 'underlining' and 'strike-through' markings, with the language added marked by underlining and language deleted being denoted by the 'strike-through' markings. The applicants believe that no new matter has been added by the changes to their claims proposed herein. Further, remarks are presented below that demonstrate how the changes made herein to the claims cause the invention disclosed thereby to be distinguished from Leavens and the other prior art cited by the Examiner. Thus, the applicants now request reconsideration by the Examiner and allowance of their amended and new claims 1-5, 7, 9-14, and 16-23.

REMARKS

## Response to Election/Restriction Requirement

The applicants acknowledge the Examiner's restriction of the present application to Group 4, as shown in Figs. 13-19, with the base member not extending beyond the tapered end of the wedge. The applicants also acknowledge the withdrawal of claims 6, 8, and 15 from further consideration as relating to a non-elected species.

## Drawings

The drawings are objected to for failing to show the 'taller end', an 'opposed tapered end', 'manufactured valley truss component combination', 'structural wood members', 'manufactured wood roof truss systems', and 'opposing sides of the wedge'. The amendments herein to the claims have deleted all of the 'objected to' phrases. Therefore, the applicants respectfully request that the Examiner withdraw her rejection of the drawings.

## Specification

The Specification is objected to for failing to provide proper antecedent basis for claimed subject matter. Objections relate to the following language in claims 1 and 12, 'manufactured valley truss component combination', 'structural wood members', and 'manufactured wood roof truss system', and 'opposing sides of the wedge'. Through amendments to the claims, the applicants have deleted all four of the above-noted phrases to which the Examiner has objected. Therefore, the applicants respectfully request that the Examiner withdraw her rejection of the Specification. Also, the Examiner notes that the 'solid wedge' mentioned in claims 3 and 16 is

interpreted as being a solid figure and not solid in volume. Through claim amendments the applicants have deleted the word 'solid' and replaced it with language that more clearly identifies the structure intended to be claimed.

#### Claim Rejection – 35 U.S.C. 112

Claim 1 is rejected under 35 USC 112, second paragraph, as being indefinite. In claim 1, the phrase 'can be' is unclear as to its limitations. The applicants have deleted the words 'can be' and provided replacement language that is not indefinite. Therefore, the applicants respectfully request that the Examiner withdraw her rejection of claim 1 under 35 USC 112.

#### Claim Rejection – 35 U.S.C. 102

Claims 1, 2, 4, 7, 11-14, 17, and 19 are rejected under 35 USC 102(b) as being anticipated by Leavens. The Leavens invention is an anchoring bracket for use in deck construction that attaches one or more horizontally-extending boards that are substantially parallel to one another to a transversely positioned joist. It has a substantially horizontally-extending 'rain-spacer side' and a substantially vertically-extending 'joist attachment side'. The 'rain-spacer side' has a 'spacing portion' that overlays the top of a supporting joist during bracket use and an 'extended portion' that does not overlay the supporting joist, the distal end of 'extended portion' being connected to the distal end of the upper 'angled portion' of the 'joist attachment side'. Thus, the 'attachment portion' downwardly depending from the 'angled portion' of the joist attachment side' is substantially perpendicular to the 'spacing portion' of the 'rain-spacer side' that depends from the 'extended side' of the 'rain-spacer side'. In addition, a plurality of 'board spacer tabs' may be affixed at intervals to the 'rain-spacer side'. The applicants believe that the structure of the present invention is different from the Leavens invention in several significant ways that would prevent the Leavens invention from functioning in the same manner as the present

invention. The Examiner states that the 'extended portion' (Leavens-#32) and the 'angled portion' (Leavens-#46) form a wedge in combination with the vertically extending side of the supporting joist (Leavens-#94), and that this wedge is positioned between a base member (the 'rain-spacer side' of Leavens-#20) and a web member (the 'attachment portion' of Leavens-#42). The applicants respectfully submit that the 'rain-spacer side' (Leavens #20) that includes 'spacing portion' (Leavens-#22) and 'extended portion' (Leavens-#32) must be horizontally-extending to support deck boards that need to be substantially horizontally-extending for effective use, while the 'angled portion' (Leavens-#46) is oblique to the 'rain-spacer side' (Leavens #20) and 'attachment portion' (Leavens-#42). In contrast, the present invention has an opposite construction. It is the planar bottom surface of the present invention (Examiner designated equivalent of Leavens #20) that is oblique to its upstanding web member (Examiner designated equivalent of Leavens #42) and the portion of the wedge in the present invention that supports a valley truss (Examiner designated equivalent of Leavens #46 even though Leavens surface #46 is not in direct contact with any board or joist) is substantially perpendicular to the present invention upstanding web member (Examiner designated equivalent of Leavens #42). A further difference between the present invention and Leavens is that in the Leavens invention fasteners are inserted into the supported deck boards through 'angled portion' #46 and 'extended portion' #32. In contrast, fasteners in the present invention are inserted into a supported valley truss through the upstanding web member (Examiner designated equivalent of Leavens #42) and the portion of planar base member extending rearwardly from the upstanding web member (Examiner designated equivalent of Leavens #22). Also, fasteners through the upstanding web member of the present invention extend into a supported valley truss, while fasteners extending through the Examiner designated equivalent in Leavens ('attachment portion' #42) further extend into the supporting joist (Leavens #94). Thus, both the structure and orientation of the present invention uplift resistance strap are different than that disclosed by Leavens. In their claim amendments herein, the applicants have more specifically identified the configuration and

orientation of their uplift resistance strap to distinguish it from that disclosed by Leavens. Since their claim language no longer describes the Leavens invention, nor a combination of Leavens and the other cited prior art, the applicants respectfully request that the Examiner withdraw her rejection of claims 1, 2, 4, 7, 11-14, 17, and 19.

#### Claim Rejection – 35 U.S.C. 103

Claims 3 and 16 are rejected under 35 USC 103(a) as being anticipated by Leavens in view of Stuart. The Examiner uses Stuart to provide a three-sided wedge. However, as is noted above in the discussion of the Examiner's claim rejections under 35 USC 102, structure differences other than a three-sided wedge distinguish the present invention from the Leavens invention. Thus, the combination of Leavens and Stuart still does not disclose or teach an invention that is structurally like, or can perform the function of, the present invention. As a result the applicants respectfully request that the Examiner withdraw her rejection of claims 3 and 16.

Claims 5 and 20 are rejected under 35 USC 103(a) as being unpatentable over Leavens since laterally centered holes are an obvious matter of design choice. However, as is noted above in the discussion of the Examiner's claim rejections under 35 USC 102, structure and orientation differences other than laterally centered holes distinguish the present invention from the Leavens invention. Thus, Leavens does not disclose or teach an invention that is structurally like, or can perform the function of, the present invention. As a result the applicants respectfully request that the Examiner withdraw her rejection of claims 5 and 20.

Claims 10 and 18 are rejected under 35 USC 103(a) as being unpatentable over Leavens in view of Calhoun. The Examiner uses Calhoun to provide a two-layer base member construction. However, as is noted above in the discussion of the Examiner's claim rejections under 35 USC 102, structure differences other than a two-layer base member construction distinguish the

present invention from the Leavens invention. Thus, the combination of Leavens and Calhoun still does not disclose or teach an invention that is structurally like, or can perform the function of, the present invention. As a result the applicants respectfully request that the Examiner withdraw her rejection of claims 10 and 18.

#### Conclusion

Since the applicants herein have now amended their claims to disclose an invention different from Leavens and the other cited prior art cited by the Examiner, and they believe that they have not added any new matter, they respectfully request that the Examiner now reconsider their amended and new claims herein and allow them.

Respectfully submitted on behalf of Timothy M. Bronson and Brian V. Fiala by:



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“Replacement Sheet” for - Inventors: Timothy M. Bronson + Brian V. Fiala Application Number: 10/044,108 File Date: 01-11-2002  
 Group Art Unit: 2912 Examiner: Christy M. Green Title: Valley Truss Uplift Resistance Strap With Wedge and Method of Use

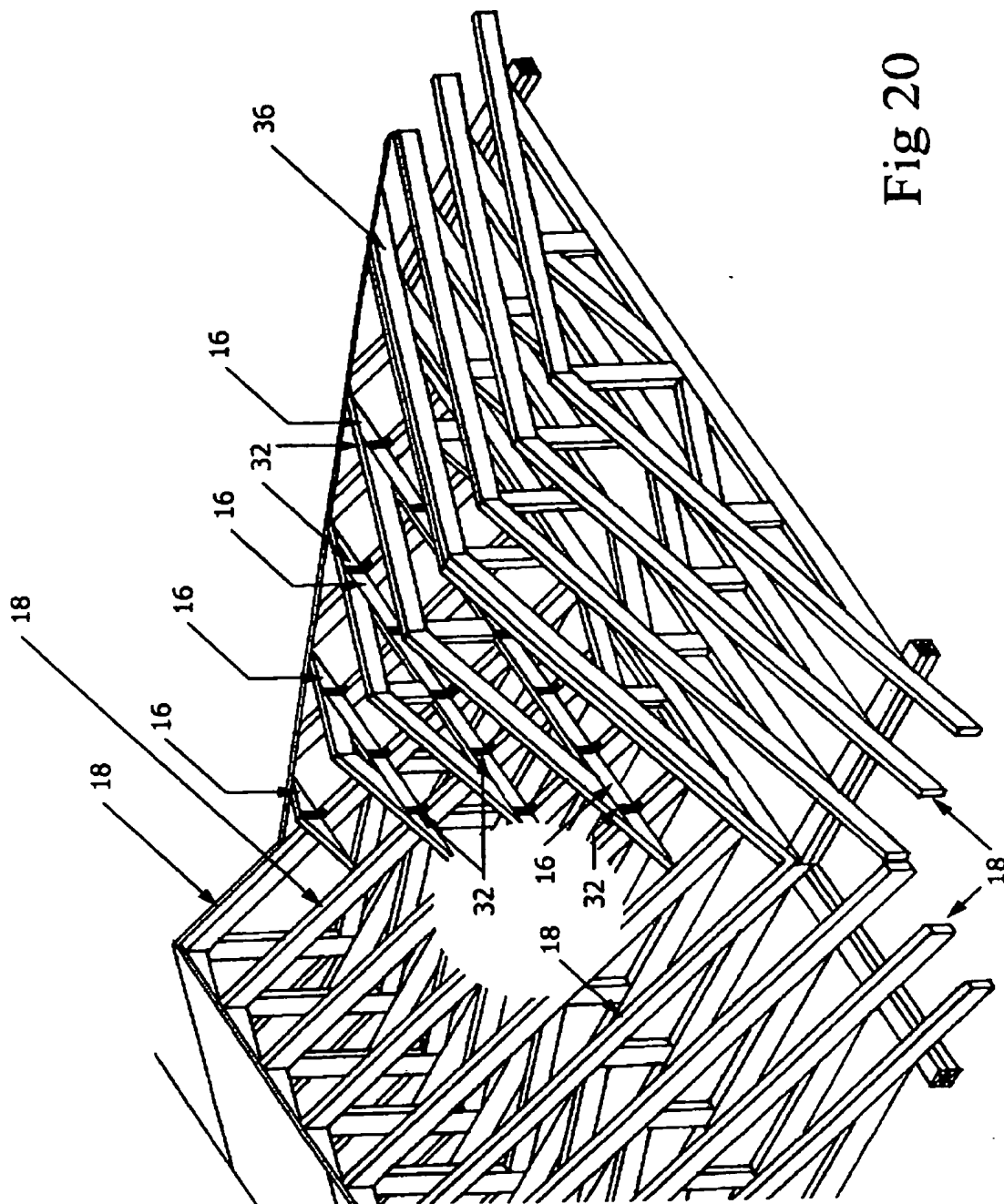


Fig 20

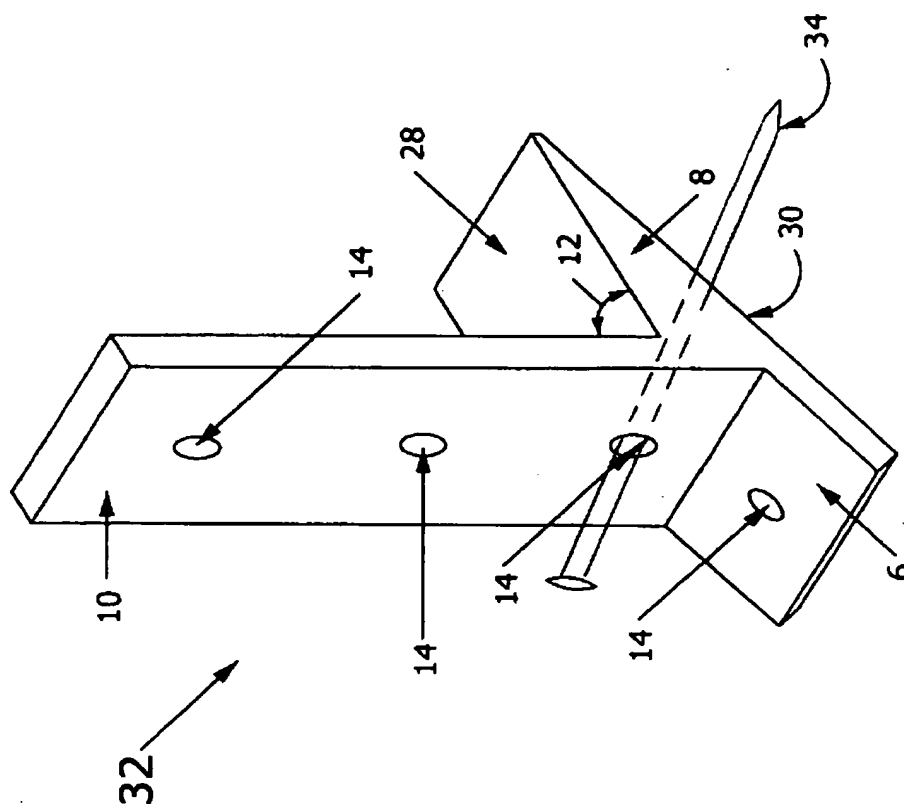
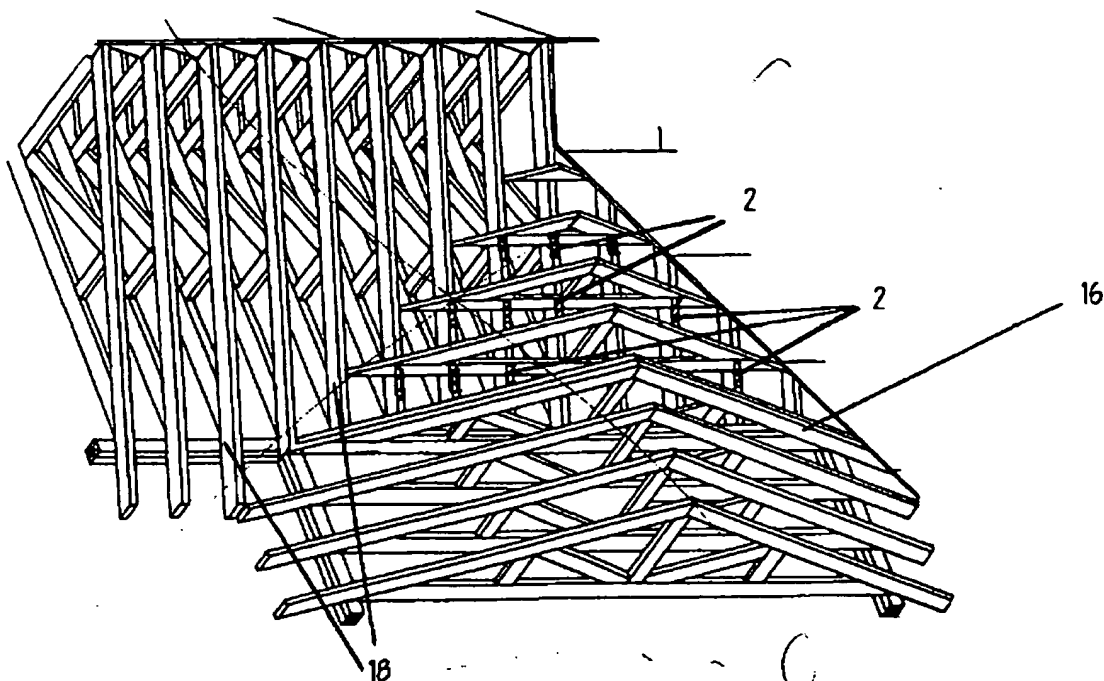


Fig 21



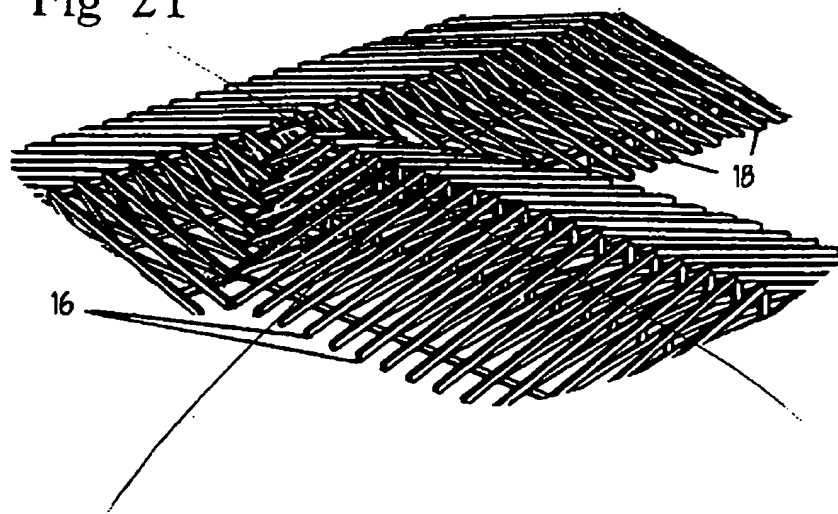
"Annotated Marked-up Drawings" for - Inventors: Timothy M. Bronson + Brian V. Fiala  
 Application Number: 10/044,108 File Date: 01-11-2002 Group Art Unit: 2912 Examiner: Christy M. Green  
 Title: Valley Truss Uplift Resistance Strap With Wedge and Method of Use



*cancel original  
 Figs 20  
 + 21*

Fig 20

Fig 21



"Annotated Marked-up Drawings" for - Inventors: Timothy M. Bronson + Brian V. Fiala  
 Application Number: 10/044,108 File Date: 01-11-2002 Group Art Unit: 2912 Examiner: Christy M. Green  
 Title: Valley Truss Uplift Resistance Strap With Wedge and Method of Use

Fig 22

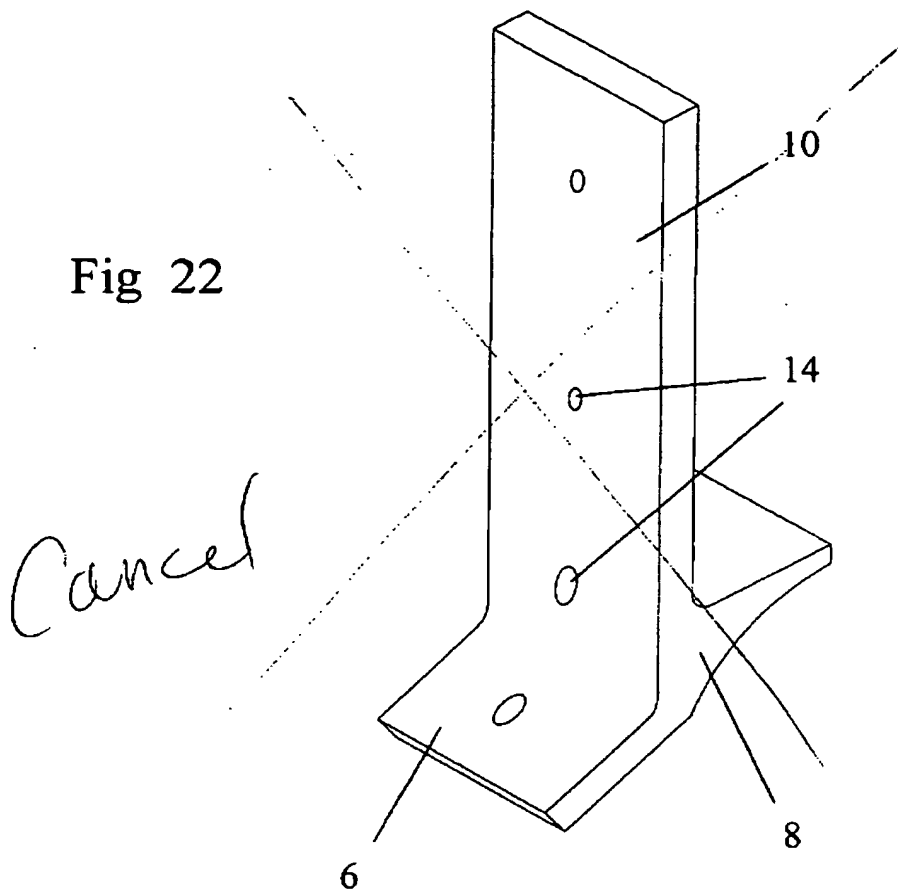


Fig. 22 was proposed as  
 a new Figure in  
 the Election/Restriction  
 Response filed 02/28/03  
 via fax

1 Applicant: Timothy M. Bronson and Brian V. Fiala  
 2 Serial Number: 10/044,108  
 3 Date Filed: January 11, 2002  
 4 Title: Valley Truss Uplift Resistance Strap With Wedge and Method of Use  
 5 Examiner: Christy M. Green  
 6 Group Art Unit: 3635

7  
 8 MARKED-UP COPY OF CLAIMS  
 9 (deleted text is in brackets and additions are underlined)

10  
 11  
 12  
 13 1. (Currently Amended) An uplift resistance device, for use in roof construction where  
 14 valleys are created to support and secure tie-down manufactured valley trusses components in a  
 15 level orientation relative to supporting structural wood members and manufactured wood  
 16 standard roof trusses systems bearing perpendicular thereto, that can be is installed from a  
 17 position solely above a roof plane and without cutting making holes in plywood sheathing  
 18 attached to between the standard roof trusses and any valley trusses overlaying them, said device  
 19 comprising:

20 a one-piece strap <sup>(10)</sup> having a vertically extending web member with opposing sides and a <sup>(40)</sup>  
 21 lower end, a base member extending from one of said opposing sides of said web member at said  
 22 lower end, and a wedge extending from the other of said opposing sides of said web member at  
 23 said lower end, said wedge having a top surface and a tapered end remote from said web  
 24 member, said base member being inclined at an angle relative to said web member corresponding  
 25 to the pitch of the roof to be constructed therewith so that in its usable position said top surface  
 26 will be substantially horizontally extending in orientation to provide level support of a valley  
 27 truss without its modification with a wedge formed between a substantially planar base member  
 28 and a web member extending upwardly from said base member at an acute angle, said wedge

1 ~~having a taller end and an opposed tapered end, said taller end being adjacent to said web~~  
2 ~~member, said base member extending rearwardly beyond said taller end of said wedge; and~~  
3 a plurality of fastener holes formed through said base member and said web member.  
4 *lack* with the top ones of said fasteners holes through said web member being configured and  
5 positioned for attachment to a valley truss supported on said top surface of said wedge and the  
6 *lack* bottommost one of said fastener holes through said web member and said fastener holes through  
7 said base member being configured and positioned for attachment to a supporting standard roof  
8 truss bearing perpendicular to the valley truss supported on said top surface of said wedge for  
9 ~~time saving construction whereby a manufactured valley truss component can be placed without~~  
10 beveling modification for roof pitch upon said wedge of said strap and be subsequently secured  
11 to said strap for time saving construction. ~~by the use of a fastener inserted through each of said~~  
12 ~~fastener holes in said web member with said strap and manufactured valley truss component~~  
13 ~~combination being attached to structural woods members and manufactured wood roof truss~~  
14 ~~systems through the use of a fastener inserted through each of said fastener holes in said base~~  
15 ~~member.~~

16 2. (Original) The device of claim 1 wherein said strap is made from molded  
17 construction.

18 3. (Currently Amended) The device of claim 12 wherein said strap has a solid closed  
19 wedge cross-sectional configuration with three perimeter sides.

20 4. (Original) The device of claim 1 further comprising one additional fastener hole  
*lack* 21 through said base member in a position under said wedge and wherein the bottommost one of  
22 said fasteners holes through said web member is aligned with said additional fastener hole and

1 configured to allow insertion of a fastener through said wedge.

2 5. (Original) The device of claim 1 wherein the one of said fasteners holes through said  
3 web member that is closest in proximity to said base member is laterally centered, and the  
4 remaining ones of said fasteners holes through said web member are not laterally centered.

5 6. (Withdrawn) The device of claim 1 wherein said base member also extends forwardly  
6 beyond said tapered end of said wedge.

7 7. (Original) The device of claim 1 wherein said strap is made from folded construction  
8 having a hollow wedge.

9 8. (Withdrawn) The device of claim 7 wherein said wedge has opposing sides between  
10 said taller end and said tapered end adapted to provide vertical support for said wedge.

11 9. (Currently Amended) The device of claim 7 wherein said wedge is open-sided ~~has~~  
12 ~~open sides and a taller end with a closed configuration adapted to provide vertical support for~~  
13 ~~said wedge.~~

14 10. (Original) The device of claim 7 wherein said base member has a two-layer  
15 construction.

16 11. (Original) The device of claim 7 wherein said strap has a rectangular unfolded  
17 configuration.

18 12. (Currently Amended) A method for use in roof construction where valleys are  
19 created to secure support and tie down manufactured valley trusses with uplift resistance  
20 components to supporting structural woods members and manufactured wood standard roof  
21 trusses systems and provide uplift resistance from a position solely above a roof plane. without  
22 the need for cutting making holes in plywood sheathing attached to the manufactured wood

1 standard roof trusses system or beveling modification of the ~~manufactured~~ valley trusses  
2 ~~components~~ to accommodate for roof pitch, said method comprising the steps of:

3 providing a plurality of one-piece straps each having a vertically extending web member  
4 with opposing sides and a lower end, a base member extending from one of said opposing sides  
5 of said web member at said lower end, and a wedge extending from the other of said opposing  
6 sides of said web member at said lower end, said wedge having a top surface and a tapered end  
7 remote from said web member, said base member being inclined as an angle relative to said web  
8 member corresponding to the pitch of the roof to be constructed therewith so that in its usable  
9 position said top surface will be substantially horizontally extending in orientation, a wedge with  
10 ~~a taller end and an opposed tapered end, a substantially planar base member, a web member~~  
11 ~~extending upwardly from said base member at an acute angle, and a plurality of fastener holes~~  
12 through said base member and said web member with the top ones of said fasteners holes  
13 through said web member being configured and positioned for attachment to a valley truss  
14 supported on said top surface of said wedge and the bottommost one of said fastener holes  
15 through said web member and said fastener holes through said base member being configured  
16 and positioned for attachment to a supporting standard roof truss bearing perpendicular to the  
17 valley truss supported on said top surface of said wedge, said base member extending rearwardly  
18 beyond said taller end of said wedge;

19 providing a plurality of fasteners, a plurality of manufactured valley trusses components,  
20 and a roof construction made from a plurality of manufactured wood standard roof trusses  
21 creating an intersection of two perpendicular roof planes ~~system;~~

1 selecting the ones of said valley trusses collectively having the appropriate configuration  
2 to extend one of said roof planes over the other bearing perpendicular thereto;

3 temporarily securing each of said valley trusses in its usable position over said standard  
4 roof trusses;

5 placing at least one of said straps under each of said valley trusses at positions where said  
6 valley trusses intersect with said standard roof trusses below, with said top surfaces of said  
7 wedges in contact with said valley trusses; and

8 using one of said fasteners through each of said fastener holes in said straps to securely  
9 attach said placed straps to said standard roof trusses and said valley trusses for uplift resistance;

10 ~~selecting one of said straps for each of said valley truss components intended for direct~~  
11 ~~attachment to said manufactured wood roof truss system;~~

12 ~~inserting a different one of said fasteners through each one of said fasteners holes in said~~  
13 ~~web members of said selected straps to attach each said selected strap to a different one of said~~  
14 ~~valley truss components; and~~

15 13. (Canceled) The method of claim 12 wherein the bottommost portion of each of said  
16 web members is adapted to function as the taller end of said wedge, and further comprising the  
17 steps of inserting one of said fasteners through said bottommost portion and through said wedge  
18 prior to inserting said same fastener through said base member.

19 14. (Original) The method of claim 12 wherein said straps are made from molded  
20 construction.

21 15. (Withdrawn) The method of claim 12 wherein said base member also extends  
22 forwardly beyond said tapered end of said wedge and further comprising the steps of inserting

1 one of said fasteners through said bottommost portion and through said wedge prior to inserting  
2 said same fastener through said base member.

3 16. (Currently Amended) The method of claim 154 wherein said strap comprises a ~~solid~~  
4 closed wedge cross-sectional configuration with three perimeter sides.

5 17. (Currently Amended) The method of claim 12 wherein said strap is made from  
6 folded construction ~~having a hollow and~~ has an open-sided wedge.

7 18. (Currently Amended) The method of claim 176 wherein said base member has a two-  
8 layer construction.

9 19. (Currently Amended) The method of claim 176 wherein said strap has an unfolded  
10 configuration that is rectangular.

11 20. (Original) The method of claim 12 wherein the one of said fasteners holes through  
12 said web member that is closest in proximity to said base member is laterally centered, and the  
13 remaining ones of said fasteners holes through said web member are not laterally centered.

14 21. (New) The device of claim 7 wherein said wedge is open-sided and has a two-layer  
15 construction.

16 22. (New) The device of claim 21 wherein said strap has a rectangular unfolded  
17 configuration.

18 23. (New) The method of claim 18 wherein said strap has an unfolded configuration that  
19 is rectangular.  
20



1 Applicant: Timothy M. Bronson and Brian V. Fiala  
2 Serial Number: 10/044,108  
3 Date Filed: January 11, 2002  
4 Title: Valley Truss Uplift Resistance Strap With Wedge and Method of Use  
5 Examiner: Christy M. Green  
6 Group Art Unit: 3635  
7  
8

9 MARKED-UP COPY OF SPECIFICATION – (Starting with Brief Description of the Drawings)  
10 (deleted text has 'strike-through markings and additions are underlined)  
11

## 12 BRIEF DESCRIPTION OF THE DRAWINGS

13 Fig. 1 is perspective view of a first embodiment of the present invention having a planar base  
14 member, a web member upwardly extending from the base member at an acute angle, a wedge  
15 positioned within the acute angle, and a plurality of fastener holes through the web member and  
16 the opposing ends of the base member.

17 Fig. 2 is a front view of two first embodiment uplift resistance straps attached between a  
18 manufactured valley truss and two standard manufactured wood roof trusses supporting it.

19 Fig. 3 is a perspective view of the first embodiment connected between a vertically extending  
20 piece of construction material with a non-beveled bottom end, and the top chord of a standard  
21 manufactured wood roof truss.

22 Fig. 4 is a perspective view of the first embodiment connected between a non-beveled  
23 horizontally extending bottom chord of a manufactured valley truss and the top chord of a  
24 standard manufactured wood roof truss.

25 Fig. 5 is a top view of a second embodiment of the present invention in a substantially flat,  
26 unfolded condition.

27 Fig. 6 is a top view of the second embodiment in a partially folded condition.

28 Fig. 7 is also a top view of the second embodiment in a partially folded condition.

29 Fig. 8 is also a top view of the second embodiment in a partially folded condition.

30 Fig. 9 is a top view of the second embodiment in a nearly complete folded condition.

1 Fig. 10 is a top view of a third embodiment of the present invention in a substantially flat,  
2 unfolded condition.

3 Fig. 11 is a top view of the third embodiment in a partially folded condition.

4 Fig. 12 is a top view of the third embodiment in a nearly complete folded condition.

5 Fig. 13 is a perspective view of a fourth embodiment of the present invention in a partially folded  
6 condition.

7 Fig. 14 is a perspective view of the fourth embodiment in a nearly complete folded condition.

8 Fig. 15 is a perspective view of the fourth embodiment in its completely folded condition ready  
9 for use.

10 Fig. 16 is a top view of the fourth embodiment in a substantially flat, unfolded condition.

11 Fig. 17 is a perspective view of the fourth embodiment connected between a vertically extending  
12 piece of construction material with a non-beveled bottom end, and the top chord of a standard  
13 manufactured wood roof truss.

14 Fig. 18 is a perspective view of the forth embodiment connected between a non-beveled  
15 horizontally extending bottom chord of a manufactured valley truss and the top chord of a  
16 standard manufactured wood roof truss.

17 Fig. 19 is a side view of the fourth embodiment having a nail inserted through the lower portion  
18 of the web member, the wedge, and the base member.

19 Fig. 20 is a perspective view of a several present invention uplift resistance straps each connected  
20 with its wedge between the horizontally extending bottom chord of a manufactured valley truss  
21 and the top chord of a standard manufactured wood roof truss. ~~Fig. 21 is a perspective view of~~  
22 ~~two perpendicularly oriented roof structures having a valley therebetween in which the present~~  
23 ~~invention could be use to provide uplift resistance.~~

24 Fig. 221 is a perspective view of a fifth embodiment of the present invention ~~having a molded~~  
25 construction having a nail inserted at an angle through its wedge.

26

## 1 DETAILED DESCRIPTION OF PREFERRED EMBODIMENTS

2 The present invention provides uplift resistance to roof construction where valleys occur.  
3 ~~two examples~~ an example of which ~~are~~ is shown in Figs. 20 ~~and 21~~. Fig. 20 shows the  
4 construction of what could be a small porch roof connected to a larger roof structure behind it,  
5 with the nine standard roof trusses 18 in the large roof structure below the four valley trusses  
6 bearing perpendicular to the four overlaying porch-valley trusses 16. This overlap of roof and  
7 ~~porch valley trusses. (18 and 16 respectively),~~ to fill in the roof plane, creates a valley. A girder  
8 truss 36 is shown in Fig 20 separating the four valley trusses 16 from three additional standard  
9 roof trusses 18 that extend parallel to valley trusses 16. With use of the preferred embodiments  
10 of the present invention uplift resistance strap, such as straps 32 in Fig. 20, the sheathing (not  
11 shown) that covers the nine standard roof trusses 18 underlaying the four valley trusses 16 would  
12 not require a hole to enable connection between strap and standard roof truss 18, as required by  
13 prior art uplift resistance straps having a different structure and positioning. Instead, use of the  
14 present invention uplift resistance strap 32 would allow a two-point connection of its planar base  
15 member 6 and wedge 8 to a standard roof truss 18 positioned below, and a two-point connection  
16 of its web member 10 to the valley truss 16 supported by its wedge 8, with all four connections  
17 being made above the roof plane. ~~In contrast, Fig. 21 shows two full roof structures connected~~  
18 ~~to one another in a T shaped configuration. The fill area where the roof structures overlap and a~~  
19 ~~set of roof trusses 18 below bear perpendicular to a second overlaying set of roof trusses 16, also~~  
20 ~~comprises a valley.~~ In addition to uplift resistance, the present invention ~~would~~ also provides a  
21 built-in wedge configured to level the overlaying valley trusses 16, without a need for beveling  
22 the bottom chord of each valley truss 16 or a need for the time-consuming on-site manufacture  
23 and installation of stand-alone wedges that allow a solid connection between supported valley  
24 trusses 16 and the sloping top chords of the standard roof trusses 18 beneath them. Further, the  
25 present would replace an elongated prior art tie-down strap that must be attached to adjoining  
26 trusses through a hole made on-site in the roof sheathing adjacent to the truss intersection. Thus,

1 connection of the elongated prior art tie-down straps is accomplished in a separate step following  
2 the step of attaching the valley truss to underlying standard roof trusses. Further, installation of  
3 the elongated tie-down strap typically requires two people, with one person positioned above the  
4 roof plane/sheathing to connect the upper portion of the elongated tie-down strap to the valley  
5 truss 16 and another person below the roof plane/sheathing to connect the lower portion of the  
6 elongated tie-down strap to the standard roof truss 18, or the same person to sequentially perform  
7 the upper and lower tie-down strap connections. In contrast, installation of the present invention  
8 is faster as it is used directly in the connection of a valley truss 16 to each of the standard roof  
9 trusses 18 supporting it, so that connection, leveling, and uplift resistance requirements are all  
10 satisfied in a single installation step. The present invention, already having a pre-formed wedge  
11 8 incorporated therein, also eliminates a need for additional steps involving the creation and  
12 connection of a stand-alone wedge or subsequent tie-down connection at each intersection of a  
13 manufactured valley truss 16 to a standard manufactured wood roof truss 18. It is contemplated  
14 for the present invention to be made of rigid materials and have a unitary construction. However,  
15 the present invention can be made from plastic, nylon and other materials formed through  
16 molded construction, or in the alternative made from a stamped piece of rigid material, preferably  
17 galvanized steel, that is pre-formed into the approximate configuration shown in Fig. 1. The  
18 wedge of the present invention, pre-formed at a designated angle appropriate to the slope of the  
19 top chord in each of the underlying standard roof trusses 18 with which it is contemplated for  
20 use, provides leveling for an overlaying valley truss 16 without the costly, labor-intensive process  
21 of beveling the bottom surface of each valley truss 16, either during manufacture or on-site, or  
22 the creation and connection of stand-alone wedges that are connected between the bottom chord  
23 of a valley truss and the top chord of each standard roof truss 18 supporting it. The wedge 8 can  
24 be solid or hollow, depending upon the materials used for its construction. Further, since holes  
25 are pre-formed through the upwardly extending web member 10 and the base member 6 of the  
26 present invention, an installer is not confronted with the additional time delays resulting from

1 replacement of wooden wedges that split or crack during fastener attachment.

2 Fig. 1 shows a first embodiment 2 of the present invention having a planar base member  
3 with a first end 4 and a second end 6, and a web member 10 upwardly extending from second end  
4 6 to form an acute angle 12 relative to first end 4. Although web member 10 appears to have  
5 approximately the same length dimension as first end 4 and second end 6, web member 10 could  
6 be shorter or longer than first end 4 and second end 6, with the length of web member 10 being  
7 determined by the governing uplift resistance code requirement. An embodiment where second  
8 end 6 is shorter than web member 10 and first end 4 has been omitted, is shown in Fig. 15. Fig. 1  
9 also shows a wedge 8 positioned within acute angle 12, and connected between first end 4 and  
10 web member 10. The height of the taller end of wedge 8 would vary according to different pitch  
11 applications. Also, although not limited thereto, the upper surface of wedge 8, which provides  
12 the seat area for an overlaying valley truss 16, would preferably have a minimum surface area of  
13 approximately one-and-one-half square inches. Fig. 1 further shows two fastener holes 14 in web  
14 member 10, two fastener holes 14 in second end 6, and one fastener hole 14 in first end 4. The  
15 number, size, spaced-apart distance, alignment, and configuration of fastener holes 14 are not  
16 critical, and at a minimum would be sufficient to meet nailing and uplift resistance requirements  
17 of the local or regional building code. Fig. 1 also shows the distal ends of first end 4, second end  
18 6, and web member 10, each being substantially rectangular in configuration and having  
19 chamfered edges to help resist bending the could otherwise occur from uplift. In addition to the  
20 configuration of corners appearing to be cut off at an approximate 45° angle, it is considered to be  
21 within the scope of the present invention for the distal ends of first end 4, second end 6, and web  
22 member 10, to also have the rounded configuration shown in Figs. 5-9, or other linear, arcuate, or  
23 curvilinear configuration. It is contemplated that first embodiment 2 would be made from  
24 molded construction, using metal, plastic, nylon, or any other material permitted by code. One  
25 preferred plastic material is polycarbonate. Also, although not limited thereto and only provided  
26 as an example, it is contemplated that the length dimension of first embodiment 2, from the distal

1 end of first end 4 to the distal end of second end 6, would be a minimum of approximately four  
2 inches and a maximum of approximately twelve inches. The first embodiment shown in Fig. 1  
3 could represent either a molded or folded uplift resistance strap. The taller end of wedge 8,  
4 which is shown in Fig. 1 in a position facing second end 6, has an open configuration expected in  
5 folded embodiments formed from the unfolded stamped configurations of second embodiment 24  
6 and third embodiment 26, shown in Figs. 5 and 10, respectively, the vertical support for wedge 8  
7 being derived from its rigid side structures. In contrast, the embodiments of the present invention  
8 made through molded construction could either have a solid wedge 8, or a hollow wedge 8  
9 similar to that shown in Fig. 1.

10 Fig. 2 shows first embodiment 2 attached between the bottom chord of a valley truss 16  
11 and the top chord of a standard roof truss 18 supporting it, with the valley truss 16 bearing  
12 perpendicular to the standard roof trusses 18. Although two first embodiment 2 attachments are  
13 shown, the number of first embodiments 2 connected between valley truss 16 and standard roof  
14 trusses 18 would be determined by the local building code. The upstanding web member 10 in  
15 each first embodiment 2 is connected to the downwardly facing side of a supported valley truss  
16 16 through fasteners (not shown) inserted through fastener holes 14, while the second end 6 of  
17 each first embodiment 2 is connected to the top cord of the standard roof truss 18 supporting the  
18 same valley truss 16, also via a fastener (not shown) inserted through each fastener hole 14  
19 present in the planar base member of first embodiment 2, which includes second end 6 and first  
20 end 4 (not visible in Fig. 2). As can be seen in Fig. 4, the bottom surface 22 of the valley truss 16  
21 would be supported and leveled by wedge 8. When the present invention is relied upon to  
22 provide a wedge 8 for non-beveled trusses 16, one first embodiment 2 would become connected  
23 at every intersection of valley truss 16 to standard roof trusses 18. As shown in Fig. 2 and  
24 mentioned above, the uplift resistance straps of first embodiment 2 are only secured on the side  
25 of valley truss 16 that is facing the downward sloping ends of the standard roof trusses 18  
26 supporting it.

1 Fig. 3 shows first embodiment 2 connected between a vertically extending piece of  
2 construction material 20, perhaps a part of a manufactured valley truss 16, with a non-beveled  
3 bottom end 22, and the top chord of a standard roof truss 18. Fig. 3 shows second end 6  
4 attached to the portion of standard roof truss 18 in a position downwardly extending below  
5 construction material 20, and web member 10 attached to the side of construction material 20  
6 that faces the downwardly extending end of standard roof truss 18 supporting it. Fig. 3 further  
7 shows the non-beveled bottom end 22 of construction material 20 supported in a substantially  
8 level position upon wedge 8, and first end 4 positioned against the top chord of the portion of  
9 standard roof truss 18 upwardly extending beyond construction material 20.

10 Fig. 4 shows first embodiment 2 connected between a horizontally extending bottom  
11 chord of a manufactured valley truss 16 and the top chord of a standard roof truss 18. As shown  
12 in Fig. 4, first embodiment 2 is only secured to valley truss 16 via web member 10, and only on  
13 the vertical side of valley truss 16 that is facing the downwardly extending ends of standard roof  
14 trusses 18. Connection between first embodiment 2 and the top chord of a standard roof truss 18  
15 is accomplished via the planar base member of first embodiment 2, which comprises second end  
16 6 and first end 4. However, in some construction application, as later seen in Figs. 19 and 21,  
17 other embodiments of the present invention only are connected to the top chord of a standard  
18 roof truss via second end 6 and ~~This is in contrast to the fourth embodiment 32 shown in Fig. 19,~~  
19 ~~wherein the bottommost fastener hole 14b in web member 10 is used in part to attach web~~  
20 ~~member 10 to the top chord of the supporting standard roof truss 18.~~ In Fig. 4, second end 6 is  
21 placed in a position adjacent to valley truss 16 and downwardly extending from valley truss 16  
22 with fasteners inserted through fasteners holes 14 and secured between first embodiment 2 and  
23 standard roof truss 18, while first end 4 is placed in a position adjacent to valley truss 16 and  
24 upwardly extending therefrom, also being secured by fasteners inserted through fasteners holes  
25 14. As shown in Fig. 4, wedge 8 is positioned under the bottom chord of valley truss 16. The  
26 degree of incline provided by wedge 8 can be varied during manufacture, to accommodate a

1 difference in roof pitch. Also, although not critical, Fig. 4 shows first end 4 and second end 6  
2 extending the full width of standard roof truss 18. The width and thickness dimensions of first  
3 end 4, second end 6, and web member 10 can vary, so as to allow a balance between the need for  
4 cost-efficient construction and compliance with the governing code requirements. The relative  
5 dimensions of first end 4, second end 6, and web member 10 can also vary, as can the number  
6 and positioning of fastener hole 14 therethrough. Also, although steel and selected plastics, such  
7 as polycarbonate, are preferred for the manufacture of first embodiment 2, other materials can be  
8 used as long as they meet the necessary strength requirements to satisfy the governing uplift  
9 resistance code.

10 Figs. 5-9 show a second embodiment 24 of the present invention in an unfolded  
11 condition, and various phases of folding. In Figs. 5-9 the distal perimeter of first ends 4A and  
12 4B, second ends 6A and 6B, as well as web member 10 are shown to have a rounded  
13 configuration. Although a blunt perimeter is favored for safety considerations to avoid injury,  
14 other perimeter configurations are also considered to be within the scope of the present invention,  
15 such as a rectangular configuration and the rectangle with chamfered ends shown in Figs. 10-12  
16 for web 10, first side 4 and second side 6, wherein the corners of are all cut off at an approximate  
17 45° angle. Fig. 5 shows second embodiment 24 in a substantially flat, unfolded condition. The  
18 arrows above web member 10 show that as the second embodiment 24 takes its final form, web  
19 member 10 would be moved rearwardly and away from second ends 6A and 6B. The arrows  
20 adjacent to second ends 6A and 6B, show that as the second embodiment 24 takes its final form,  
21 second ends 6A and 6B would each be moved forwardly and toward one another. Figs. 6, 7, and  
22 8 show second embodiment 24 in a partially folded condition, with each successively higher  
23 numbered illustration showing second embodiment 24 progressively closer to its usable  
24 configuration, while Fig. 9 shows second embodiment 24 in a nearly complete folded condition.  
25 Fig. 6 shows second ends 6A and 6B closer together than in Fig. 5, with web member 10 more  
26 rearwardly positioned than in Fig. 5. Fig. 7 shows second end 6B being inwardly folded and



1 rotated approximately 180° from its original pre-folded position, with second end 6B being  
2 poised for a similar 180° inwardly folded rotation. Although second end 6B is shown undergoing  
3 the 180° rotation first, the order of such rotation is not critical. Fig. 8 shows both second ends 6A  
4 and 6B after undergoing a near 180° rotation, but not yet aligned with one another as they would  
5 be when second embodiment 24 has reached its final configuration. Fig. 10 shows second end  
6 6B and first end 4B aligned with web member 10, with second end 6A and first end 4A needing  
7 approximately 90° more rotation for second embodiment 24 to reach its usable configuration,  
8 similar to that shown in Fig. 1. When folding is complete, wedge 8 in second embodiment 24  
9 would have the same hollow configuration shown in Fig. 1. It is contemplated for second  
10 embodiment 24 to be made from rigid material, such as steel, plastic, or nylon, and have a  
11 substantially uniform thickness.

12 Figs. 10, 11, and 12 respectively show a third embodiment 26 of the present invention in  
13 a substantially flat unfolded condition, an intermediate folded condition, and a nearly complete  
14 folded condition. It is contemplated for third embodiment 26 to be made from rigid material,  
15 such as steel, nylon, or plastic, and have a substantially uniform thickness. Figs. 10-12 further  
16 show the planar base member having first end 4 and second end 6, and web member 10 all of  
17 similar length and width dimension, each as being substantially rectangular with chamfered distal  
18 ends, wherein the corners are all cut off at an approximate 45° angle. Fig. 10 shows third  
19 embodiment 26 in a substantially flattened condition, prior to folding. In Fig. 11, the arrows  
20 above web member 10 show that as the third embodiment 26 takes its final form, web member  
21 10 would be moved rearwardly and away from wedge 8. The arrows adjacent to second end 6  
22 and first end 4, show that as the third embodiment 26 takes its final form, second end 6 and first  
23 end 4 would each be moved forwardly and toward one another. Fig. 12 shows that first end 4  
24 and second end 6 also undergo an approximate 180° rotation relative to their original pre-folded  
25 conditions, prior to the third embodiment 26 reaching its usable configuration. Either second end  
26 6 or first end 4 can be folded in advance of the other, or both can be folded at once since there is

1 no overlap of one member relative to the other similar to that occurring in the folding of second  
2 embodiment 24. Fig. 12 shows second end 6 and first end 4 almost aligned with one another as  
3 they would be when third embodiment 26 has reached its final configuration, similar to that  
4 shown in Fig. 1, with third embodiment 26 having a hollow wedge 8. The adjoining surfaces of  
5 first end 4 and second end 6, which extend diagonally and form the bottom surface of wedge 8,  
6 can be bonded or welded to one another during manufacture, if needed to satisfy the governing  
7 code requirements.

8 Figs. 13-19 show a fourth embodiment 32 of the present invention in an unfolded  
9 condition, and various phases of folding, as well as in positions of use. Figs 13 and 14 show  
10 fourth embodiment 32 in partially folded conditions, while Fig. 16 shows fourth embodiment 32  
11 in a substantially flat, unfolded condition and Fig. 15 shows fourth embodiment 32 in its  
12 completely folded condition ready for use. Fig. 15 shows the present invention having an  
13 upstanding web member 10, a hollow wedge 8 having an upper surface 28 extending forwardly  
14 from web member 10, a rearwardly extending second end 6, and several fastener holes 14.  
15 Second end 6 is significantly shorter than web member 10, and in fourth embodiment 32 no first  
16 end 4 is present. Another difference in fourth embodiment 32 is that wedge 8 has a vertical back  
17 wall containing fastener hole 14b1, instead of the laterally positioned walls shown in Fig. 1. A  
18 further difference between fourth embodiment 32 and the other illustrated embodiments of the  
19 present invention is that fourth embodiment 32 contains fastener holes 14b, 14c, 14b1, and 14c1,  
20 which collectively allow a fastener, such as fastener 34 in Fig. 19, to be secured through wedge 8.  
21 Although not limited thereto, Fig. 15 shows three fastener holes 14 through web member 10,  
22 with the upper holes being offset from one another as well as from the laterally centered bottom  
23 fastener holes 14. While the angle 12 between upper wedge surface 28 and web member 10 is  
24 shown in Fig. 15 to be approximately 90°, the intersection between the bottom surface of wedge  
25 8 and web member 10 typically represents an acute angle more pronounced than illustrated. Fig.  
26 16 shows fourth embodiment 32 in its flattened, unfolded condition. Moving from left to right in

1 the illustration of unfolded fourth embodiment 32 in Fig. 16, one first encounters web member  
2 10 with three fastener holes, the bottommost of which is designated by the number 14b. To the  
3 right of web member 10, one next encounters rearwardly extending second end 6, with one  
4 centrally positioned fastener hole 14a. The bottom surface 30 of fourth embodiment 32 is  
5 situated to the right of rearwardly extending second end 6 and contains two fastener holes 14a1  
6 and 14c. The upper surface of wedge 8 extends to the right of bottom surface 30 and has no  
7 fasteners holes 14. The remaining two sections of fourth embodiment 32 having centered  
8 fastener holes 14b1 and 14c1 are unnumbered and are reinforcement members for wedge 8, the  
9 one which contains fastener hole 14b1 forming a vertically extending back wall of wedge 8  
10 during use. Thus, when fully formed, the structure of wedge 8 in the fourth embodiment would  
11 comprise open sides, a double layer of vertical support at its taller end, a partially doubled bottom  
12 surface 30, and aligned fastener holes 14b, 14b1, 14c, and 14c1 that would allow a fastener, such  
13 as fastener 34 in Fig. 19 to pass through both layers at the taller end of wedge 8, exit through  
14 both layers forming the bottom surface 30 of wedge 8, and enter the top chord of the standard  
15 roof truss 18 upon which the fourth embodiment 32 is supported during use. To fold fourth  
16 embodiment 32 into its usable configuration, the lower end of web member 10 is brought into  
17 contact with bottom surface 30 so that fastener holes 14a and 14a1 become aligned to form  
18 second end 6. As this occurs, rearwardly extending second end 6 becomes superimposed upon a  
19 portion of bottom surface 30. In a separate step, the opposing end on fourth embodiment 32 is  
20 folded to form wedge 8, with fastener hole 14b1 becoming aligned with fastener hole 14b in the  
21 lower end of web member 10, and fastener hole 14c1 becoming aligned with fastener hole 14c in  
22 bottom surface 30. Arrows in Figs. 13 and 14 show the directions of folding. Thus, it is  
23 contemplated for four fasteners, such as fastener 34 in Fig. 19 that is configured as a nail, to be  
24 used for securing fourth embodiment 32 in place during use. A first fastener 34 would extend  
25 through two fastener holes, 14a and 14a1 to connect second end 6 to the downwardly extending  
26 portion of the top chord of a standard roof truss 18. A second fastener 34 would extend through

1 two fastener holes, 14b and 14b1, further extend through wedge 8, and then finally through two  
2 additional fastener holes, 14c1 and 14c to connect web member 10 and wedge 8 to the top chord  
3 of the same standard roof truss 18. The final two nails 34 would each extend through a different  
4 one of the upper fastener holes 14 in web member 10 to connect web member 10 to the vertically  
5 extending side of valley truss 16 facing second end 6. Fourth embodiment 32 has the simplest  
6 construction, and would produce the least material waste during manufacture. It is contemplated  
7 for wedge 8 to be manufactured with varying pitch, depending upon the application, and for  
8 fourth embodiment 32 to be made from rigid material, such as steel, plastic, nylon, and have a  
9 substantially uniform thickness. As an alternative to folded construction, a molded embodiment  
10 similar to that shown in Figs. 15 and 19 is also considered to be within the scope of the present  
11 invention, and which would preferably have a solid wedge 8, as well as a fastener hole 14  
12 through wedge 8 in a similar position to that shown for fastener 34 in Fig. 19. Although not  
13 limited thereto, such a molded embodiment could be made from plastic material, such as  
14 polycarbonate. Fig. 17 shows fourth embodiment 32 connected between a vertically extending  
15 piece of construction material 20 with a non-beveled bottom end 22, and the top chord of a  
16 standard manufactured wood roof truss 18, while Fig. 18 shows forth embodiment 32 connected  
17 between a non-beveled horizontally extending bottom chord of a manufactured valley truss 16  
18 and the top chord of a standard manufactured wood roof truss 18. Although the upper surface 28  
19 of wedge 8 is not marked in Fig. 17 or Fig. 18 for clarity of illustration, both Figs 17 and 18 show  
20 upper wedge surface 28 positioned entirely under the superimposed construction material,  
21 vertically extending piece of construction material 20 or manufactured valley truss 16,  
22 respectively. ~~Fig. 22 shows a fifth preferred embodiment of the present invention, similar in~~  
23 ~~configuration to that shown in Fig. 15 and having a molded construction.~~

24 Fig. 20 shows several present invention uplift resistance straps, such as ~~first~~ fourth  
25 embodiments 32, each connected between the horizontally extending bottom chord of a  
26 manufactured valley truss 16 and the top chord of a standard roof truss 18. In the center of Fig.

20, one can see four valley trusses 16 supported by varying numbers of fourth embodiments 32, determined according to length and supported upon standard roof trusses 18 bearing perpendicular thereto. In the lower right portion of Fig. 20, three standard roof trusses 18, this time parallel to the four valley trusses 16, are separated from the valley trusses by a girder truss 36. Fig. 21 is a perspective view of two perpendicularly oriented roof structures having a valley therebetween where the present invention could be used for uplift resistance. As shown in Fig. 20, the web members 10 of first-fourth embodiments 32 are only secured on the vertically extending side of valley trusses 16 facing the downwardly extending ends of standard roof trusses 18. It is contemplated that the web members 10 of the second embodiments 24, the third embodiments 26, and the fourth-first embodiments 32 would also be connected to the sides of valley trusses 16 the downwardly extending ends of standard roof trusses 18, with the bottommost fastener hole 14b of fourth embodiments 32 being used with a fastener 34 that extends into the top chord of a supporting standard roof truss 18 and thereby connects web member 10 and wedge 8 to the supporting standard roof truss 18. The two top fastener holes 14 are used to secure web 10 to a vertically extending surface of valley truss 16, while the valley truss is levelly supported upon the top surface 28 of wedge 8, the slant of the bottom surface 30 of fourth embodiment 32, as determined by angle 13, complements the incline of the standard roof trusses 18 to place the top surface 28 in a substantially horizontally extending orientation.

Fig. 21 shows a fifth preferred embodiment of the present invention, similar in configuration to that shown in Fig. 15 and having a molded construction. Fig. 21 is different from the fourth embodiment shown in Fig. 15 and 19 only in that middle fastener hole 14 in Fig. 15 is not aligned with the top and bottom fastener holes 14 on web 10, and the fastener hole 14 through the bottom wedge 8 is visible in Fig. 15, and not Fig. 21. The fourth embodiment 32 shown in Fig. 21 also has a second end 6 and web 10 having a greater thickness dimension than that shown in Fig. 15, none of which are critical differences. Figs. 21 and 19 both show a fastener 34 extending into the rear surface of web 10, through wedge 8, and beyond the bottom

1 surface 30 of wedge 8. Angle 12 varies according to the pitch established for the roof  
2 construction formed by the standard roof trusses 18 supporting valley trusses 16, so that the  
3 bottom surfaces 22 of the valley trusses 16 are always supported by top surface 28 in a level  
4 orientation.  
5

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5 Examiner: Christy M. Green  
6 Group Art Unit: 3635

7  
8 CLEAN COPY OF SPECIFICATION – (Starting with Brief Description of the Drawings)

9

10 BRIEF DESCRIPTION OF THE DRAWINGS

11 Fig. 1 is perspective view of a first embodiment of the present invention having a planar base  
12 member, a web member upwardly extending from the base member at an acute angle, a wedge  
13 positioned within the acute angle, and a plurality of fastener holes through the web member and  
14 the opposing ends of the base member.

15 Fig. 2 is a front view of two first embodiment uplift resistance straps attached between a  
16 manufactured valley truss and two standard manufactured wood roof trusses supporting it.

17 Fig. 3 is a perspective view of the first embodiment connected between a vertically extending  
18 piece of construction material with a non-beveled bottom end, and the top chord of a standard  
19 manufactured wood roof truss.

20 Fig. 4 is a perspective view of the first embodiment connected between a non-beveled  
21 horizontally extending bottom chord of a manufactured valley truss and the top chord of a  
22 standard manufactured wood roof truss.

23 Fig. 5 is a top view of a second embodiment of the present invention in a substantially flat,  
24 unfolded condition.

25 Fig. 6 is a top view of the second embodiment in a partially folded condition.

26 Fig. 7 is also a top view of the second embodiment in a partially folded condition.

27 Fig. 8 is also a top view of the second embodiment in a partially folded condition.

28 Fig. 9 is a top view of the second embodiment in a nearly complete folded condition.

29 Fig. 10 is a top view of a third embodiment of the present invention in a substantially flat.

1 unfolded condition.

2 Fig. 11 is a top view of the third embodiment in a partially folded condition.

3 Fig. 12 is a top view of the third embodiment in a nearly complete folded condition.

4 Fig. 13 is a perspective view of a fourth embodiment of the present invention in a partially folded  
5 condition.

6 Fig. 14 is a perspective view of the fourth embodiment in a nearly complete folded condition.

7 Fig. 15 is a perspective view of the fourth embodiment in its completely folded condition ready  
8 for use.

9 Fig. 16 is a top view of the fourth embodiment in a substantially flat, unfolded condition.

10 Fig. 17 is a perspective view of the fourth embodiment connected between a vertically extending  
11 piece of construction material with a non-beveled bottom end, and the top chord of a standard  
12 manufactured wood roof truss.

13 Fig. 18 is a perspective view of the forth embodiment connected between a non-beveled  
14 horizontally extending bottom chord of a manufactured valley truss and the top chord of a  
15 standard manufactured wood roof truss.

16 Fig. 19 is a side view of the fourth embodiment having a nail inserted through the lower portion  
17 of the web member, the wedge, and the base member.

18 Fig. 20 is a perspective view of a several present invention uplift resistance straps each connected  
19 with its wedge between the horizontally extending bottom chord of a manufactured valley truss  
20 and the top chord of a standard manufactured wood roof truss.

21 Fig. 21 is a perspective view of a fifth embodiment of the present invention having a nail inserted  
22 at an angle through its wedge.

23

## 24 DETAILED DESCRIPTION OF PREFERRED EMBODIMENTS

25 The present invention provides uplift resistance to roof construction where valleys occur,  
26 an example of which is shown in Fig. 20. Fig. 20 shows the construction of what could be a



1 small porch roof connected to a larger roof structure behind it, with the nine standard roof trusses  
2 18 in the larger roof structure below the four valley trusses 16 bearing perpendicular to the four  
3 overlaying valley trusses 16. This overlap of roof and valley trusses, (18 and 16 respectively), to  
4 fill in the roof plane, creates a valley. A girder truss 36 is shown in Fig. 20 separating the four  
5 valley trusses 16 from three additional standard roof trusses 18 that extend parallel to valley  
6 trusses 16. With use of the preferred embodiments of the present invention uplift resistance  
7 strap, such as straps 32 in Fig. 20, the sheathing (not shown) that covers the nine standard roof  
8 trusses 18 underlaying the four valley trusses 16 would not require a hole to enable connection  
9 between strap and standard roof truss 18, as required by prior art uplift resistance straps having a  
10 different structure and positioning. Instead, use of the present invention uplift resistance strap 32  
11 would allow a two-point connection of its planar base member 6 and wedge 8 to a standard roof  
12 truss 18 positioned below, and a two-point connection of its web member 10 to the valley truss  
13 16 supported by its wedge 8, with all four connections being made above the roof plane. In  
14 addition to uplift resistance, the present invention also provides a built-in wedge configured to  
15 level the overlaying valley trusses 16, without a need for beveling the bottom chord of each  
16 valley truss 16 or a need for the time-consuming on-site manufacture and installation of stand-  
17 alone wedges that allow a solid connection between supported valley trusses 16 and the sloping  
18 top chords of the standard roof trusses 18 beneath them. Further, the present would replace an  
19 elongated prior art tie-down strap that must be attached to adjoining trusses through a hole made  
20 on-site in the roof sheathing adjacent to the truss intersection. Thus, connection of the elongated  
21 prior art tie-down straps is accomplished in a separate step following the step of attaching the  
22 valley truss to underlying standard roof trusses. Further, installation of the elongated tie-down  
23 strap typically requires two people, with one person positioned above the roof plane/sheathing to  
24 connect the upper portion of the elongated tie-down strap to the valley truss 16 and another  
25 person below the roof plane/sheathing to connect the lower portion of the elongated tie-down  
26 strap to the standard roof truss 18, or the same person to sequentially perform the upper and

1 lower tie-down strap connections. In contrast, installation of the present invention is faster as it  
2 is used directly in the connection of a valley truss 16 to each of the standard roof trusses 18  
3 supporting it, so that connection, leveling, and uplift resistance requirements are all satisfied in a  
4 single installation step. The present invention, already having a pre-formed wedge 8  
5 incorporated therein, also eliminates a need for additional steps involving the creation and  
6 connection of a stand-alone wedge or subsequent tie-down connection at each intersection of a  
7 manufactured valley truss 16 to a standard manufactured wood roof truss 18. It is contemplated  
8 for the present invention to be made of rigid materials and have a unitary construction. However,  
9 the present invention can be made from plastic, nylon and other materials formed through  
10 molded construction, or in the alternative made from a stamped piece of rigid material, preferably  
11 galvanized steel, that is pre-formed into the approximate configuration shown in Fig. 1. The  
12 wedge of the present invention, pre-formed at a designated angle appropriate to the slope of the  
13 top chord in each of the underlying standard roof trusses 18 with which it is contemplated for  
14 use, provides leveling for an overlaying valley truss 16 without the costly, labor-intensive process  
15 of beveling the bottom surface of each valley truss 16, either during manufacture or on-site, or  
16 the creation and connection of stand-alone wedges that are connected between the bottom chord  
17 of a valley truss and the top chord of each standard roof truss 18 supporting it. The wedge 8 can  
18 be solid or hollow, depending upon the materials used for its construction. Further, since holes  
19 are pre-formed through the upwardly extending web member 10 and the base member 6 of the  
20 present invention, an installer is not confronted with the additional time delays resulting from  
21 replacement of wooden wedges that split or crack during fastener attachment.

22 Fig. 1 shows a first embodiment 2 of the present invention having a planar base member  
23 with a first end 4 and a second end 6, and a web member 10 upwardly extending from second end  
24 6 to form an acute angle 12 relative to first end 4. Although web member 10 appears to have  
25 approximately the same length dimension as first end 4 and second end 6, web member 10 could  
26 be shorter or longer than first end 4 and second end 6, with the length of web member 10 being

1 determined by the governing uplift resistance code requirement. An embodiment where second  
2 end 6 is shorter than web member 10 and first end 4 has been omitted, is shown in Fig. 15. Fig. 1  
3 also shows a wedge 8 positioned within acute angle 12, and connected between first end 4 and  
4 web member 10. The height of the taller end of wedge 8 would vary according to different pitch  
5 applications. Also, although not limited thereto, the upper surface of wedge 8, which provides  
6 the seat area for an overlaying valley truss 16, would preferably have a minimum surface area of  
7 approximately one-and-one-half square inches. Fig. 1 further shows two fastener holes 14 in web  
8 member 10, two fastener holes 14 in second end 6, and one fastener hole 14 in first end 4. The  
9 number, size, spaced-apart distance, alignment, and configuration of fastener holes 14 are not  
10 critical, and at a minimum would be sufficient to meet nailing and uplift resistance requirements  
11 of the local or regional building code. Fig. 1 also shows the distal ends of first end 4, second end  
12 6, and web member 10, each being substantially rectangular in configuration and having  
13 chamfered edges to help resist bending that could otherwise occur from uplift. In addition to the  
14 configuration of corners appearing to be cut off at an approximate 45° angle, it is considered to be  
15 within the scope of the present invention for the distal ends of first end 4, second end 6, and web  
16 member 10, to also have the rounded configuration shown in Figs. 5-9, or other linear, arcuate, or  
17 curvilinear configuration. It is contemplated that first embodiment 2 would be made from  
18 molded construction, using metal, plastic, nylon, or any other material permitted by code. One  
19 preferred plastic material is polycarbonate. Also, although not limited thereto and only provided  
20 as an example, it is contemplated that the length dimension of first embodiment 2, from the distal  
21 end of first end 4 to the distal end of second end 6, would be a minimum of approximately four  
22 inches and a maximum of approximately twelve inches. The first embodiment shown in Fig. 1  
23 could represent either a molded or folded uplift resistance strap. The taller end of wedge 8,  
24 which is shown in Fig. 1 in a position facing second end 6, has an open configuration expected in  
25 folded embodiments formed from the unfolded stamped configurations of second embodiment 24  
26 and third embodiment 26, shown in Figs. 5 and 10, respectively, the vertical support for wedge 8

1 being derived from its rigid side structures. In contrast, the embodiments of the present invention  
2 made through molded construction could either have a solid wedge 8, or a hollow wedge 8  
3 similar to that shown in Fig. 1.

4 Fig. 2 shows first embodiment 2 attached between the bottom chord of a valley truss 16  
5 and the top chord of a standard roof truss 18 supporting it, with the valley truss 16 bearing  
6 perpendicular to the standard roof trusses 18. Although two first embodiment 2 attachments are  
7 shown, the number of first embodiments 2 connected between valley truss 16 and standard roof  
8 trusses 18 would be determined by the local building code. The upstanding web member 10 in  
9 each first embodiment 2 is connected to the downwardly facing side of a supported valley truss  
10 16 through fasteners (not shown) inserted through fastener holes 14, while the second end 6 of  
11 each first embodiment 2 is connected to the top cord of the standard roof truss 18 supporting the  
12 same valley truss 16, also via a fastener (not shown) inserted through each fastener hole 14  
13 present in the planar base member of first embodiment 2, which includes second end 6 and first  
14 end 4 (not visible in Fig. 2). As can be seen in Fig 4, the bottom surface 22 of the valley truss 16  
15 would be supported and leveled by wedge 8. When the present invention is relied upon to  
16 provide a wedge 8 for non-beveled trusses 16, one first embodiment 2 would become connected  
17 at every intersection of valley truss 16 to standard roof trusses 18. As shown in Fig. 2 and  
18 mentioned above, the uplift resistance straps of first embodiment 2 are only secured on the side  
19 of valley truss 16 that is facing the downward sloping ends of the standard roof trusses 18  
20 supporting it.

21 Fig. 3 shows first embodiment 2 connected between a vertically extending piece of  
22 construction material 20, perhaps a part of a manufactured valley truss 16, with a non-beveled  
23 bottom end 22, and the top chord of a standard roof truss 18. Fig. 3 shows second end 6  
24 attached to the portion of standard roof truss 18 in a position downwardly extending below  
25 construction material 20, and web member 10 attached to the side of construction material 20  
26 that faces the downwardly extending end of standard roof truss 18 supporting it. Fig. 3 further

1 shows the non-beveled bottom end 22 of construction material 20 supported in a substantially  
2 level position upon wedge 8, and first end 4 positioned against the top chord of the portion of  
3 standard roof truss 18 upwardly extending beyond construction material 20.

4 Fig. 4 shows first embodiment 2 connected between a horizontally extending bottom  
5 chord of a manufactured valley truss 16 and the top chord of a standard roof truss 18. As shown  
6 in Fig. 4, first embodiment 2 is only secured to valley truss 16 via web member 10, and only on  
7 the vertical side of valley truss 16 that is facing the downwardly extending ends of standard roof  
8 trusses 18. Connection between first embodiment 2 and the top chord of a standard roof truss 18  
9 is accomplished via the planar base member of first embodiment 2, which comprises second end  
10 6 and first end 4. However, in some construction applications, as later seen in Figs. 19 and 21,  
11 other embodiments of the present invention only are connected to the top chord of a standard  
12 roof truss 18 via second end 6 and the bottommost fastener hole 14b in web member 10. In Fig.  
13 4, second end 6 is placed in a position adjacent to valley truss 16 and downwardly extending  
14 from valley truss 16 with fasteners inserted through fasteners holes 14 and secured between first  
15 embodiment 2 and standard roof truss 18, while first end 4 is placed in a position adjacent to  
16 valley truss 16 and upwardly extending therefrom, also being secured by fasteners inserted  
17 through fasteners holes 14. As shown in Fig. 4, wedge 8 is positioned under the bottom chord of  
18 valley truss 16. The degree of incline provided by wedge 8 can be varied during manufacture, to  
19 accommodate a difference in roof pitch. Also, although not critical, Fig. 4 shows first end 4 and  
20 second end 6 extending the full width of standard roof truss 18. The width and thickness  
21 dimensions of first end 4, second end 6, and web member 10 can vary, so as to allow a balance  
22 between the need for cost-efficient construction and compliance with the governing code  
23 requirements. The relative dimensions of first end 4, second end 6, and web member 10 can also  
24 vary, as can the number and positioning of fastener hole 14 therethrough. Also, although steel  
25 and selected plastics, such as polycarbonate, are preferred for the manufacture of first  
26 embodiment 2, other materials can be used as long as they meet the necessary strength

1 requirements to satisfy the governing uplift resistance code.

2 Figs. 5-9 show a second embodiment 24 of the present invention in an unfolded  
3 condition, and various phases of folding. In Figs. 5-9 the distal perimeter of first ends 4A and  
4 4B, second ends 6A and 6B, as well as web member 10 are shown to have a rounded  
5 configuration. Although a blunt perimeter is favored for safety considerations to avoid injury,  
6 other perimeter configurations are also considered to be within the scope of the present invention,  
7 such as a rectangular configuration and the rectangle with chamfered ends shown in Figs. 10-12  
8 for web 10, first side 4 and second side 6, wherein the corners of are all cut off at an approximate  
9 45° angle. Fig. 5 shows second embodiment 24 in a substantially flat, unfolded condition. The  
10 arrows above web member 10 show that as the second embodiment 24 takes its final form, web  
11 member 10 would be moved rearwardly and away from second ends 6A and 6B. The arrows  
12 adjacent to second ends 6A and 6B, show that as the second embodiment 24 takes its final form,  
13 second ends 6A and 6B would each be moved forwardly and toward one another. Figs. 6, 7, and  
14 8 show second embodiment 24 in a partially folded condition, with each successively higher  
15 numbered illustration showing second embodiment 24 progressively closer to its usable  
16 configuration, while Fig. 9 shows second embodiment 24 in a nearly complete folded condition.  
17 Fig. 6 shows second ends 6A and 6B closer together than in Fig. 5, with web member 10 more  
18 rearwardly positioned than in Fig. 5. Fig. 7 shows second end 6B being inwardly folded and  
19 rotated approximately 180° from its original pre-folded position, with second end 6B being  
20 poised for a similar 180° inwardly folded rotation. Although second end 6B is shown undergoing  
21 the 180° rotation first, the order of such rotation is not critical. Fig. 8 shows both second ends 6A  
22 and 6B after undergoing a near 180° rotation, but not yet aligned with one another as they would  
23 be when second embodiment 24 has reached its final configuration. Fig. 10 shows second end  
24 6B and first end 4B aligned with web member 10, with second end 6A and first end 4A needing  
25 approximately 90° more rotation for second embodiment 24 to reach its usable configuration,  
26 similar to that shown in Fig. 1. When folding is complete, wedge 8 in second embodiment 24

1 would have the same hollow configuration shown in Fig. 1. It is contemplated for second  
2 embodiment 24 to be made from rigid material, such as steel, plastic, or nylon, and have a  
3 substantially uniform thickness.

4 Figs. 10, 11, and 12 respectively show a third embodiment 26 of the present invention in  
5 a substantially flat unfolded condition, an intermediate folded condition, and a nearly complete  
6 folded condition. It is contemplated for third embodiment 26 to be made from rigid material,  
7 such as steel, nylon, or plastic, and have a substantially uniform thickness. Figs. 10-12 further  
8 show the planar base member having first end 4 and second end 6, and web member 10 all of  
9 similar length and width dimension, each as being substantially rectangular with chamfered distal  
10 ends, wherein the corners are all cut off at an approximate 45° angle. Fig. 10 shows third  
11 embodiment 26 in a substantially flattened condition, prior to folding. In Fig. 11, the arrows  
12 above web member 10 show that as the third embodiment 26 takes its final form, web member  
13 10 would be moved rearwardly and away from wedge 8. The arrows adjacent to second end 6  
14 and first end 4, show that as the third embodiment 26 takes its final form, second end 6 and first  
15 end 4 would each be moved forwardly and toward one another. Fig. 12 shows that first end 4  
16 and second end 6 also undergo an approximate 180° rotation relative to their original pre-folded  
17 conditions, prior to the third embodiment 26 reaching its usable configuration. Either second end  
18 6 or first end 4 can be folded in advance of the other, or both can be folded at once since there is  
19 no overlap of one member relative to the other similar to that occurring in the folding of second  
20 embodiment 24. Fig. 12 shows second end 6 and first end 4 almost aligned with one another as  
21 they would be when third embodiment 26 has reached its final configuration, similar to that  
22 shown in Fig. 1, with third embodiment 26 having a hollow wedge 8. The adjoining surfaces of  
23 first end 4 and second end 6, which extend diagonally and form the bottom surface of wedge 8,  
24 can be bonded or welded to one another during manufacture, if needed to satisfy the governing  
25 code requirements.

26 Figs. 13-19 show a fourth embodiment 32 of the present invention in an unfolded

1 condition, and various phases of folding, as well as in positions of use. Figs 13 and 14 show  
2 fourth embodiment 32 in partially folded conditions, while Fig. 16 shows fourth embodiment 32  
3 in a substantially flat, unfolded condition and Fig. 15 shows fourth embodiment 32 in its  
4 completely folded condition ready for use. Fig. 15 shows the present invention having an  
5 upstanding web member 10, a hollow wedge 8 having an upper surface 28 extending forwardly  
6 from web member 10, a rearwardly extending second end 6, and several fastener holes 14.  
7 Second end 6 is significantly shorter than web member 10, and in fourth embodiment 32 no first  
8 end 4 is present. Another difference in fourth embodiment 32 is that wedge 8 has a vertical back  
9 wall containing fastener hole 14b1, instead of the laterally positioned walls shown in Fig. 1. A  
10 further difference between fourth embodiment 32 and the other illustrated embodiments of the  
11 present invention is that fourth embodiment 32 contains fastener holes 14b, 14c, 14b1, and 14c1,  
12 which collectively allow a fastener, such as fastener 34 in Fig. 19, to be secured through wedge 8.  
13 Although not limited thereto, Fig. 15 shows three fastener holes 14 through web member 10,  
14 with the upper holes being offset from one another as well as from the laterally centered bottom  
15 fastener holes 14. While the angle 12 between upper wedge surface 28 and web member 10 is  
16 shown in Fig. 15 to be approximately 90°, the intersection between the bottom surface of wedge  
17 8 and web member 10 typically represents an acute angle more pronounced than illustrated. Fig.  
18 16 shows fourth embodiment 32 in its flattened, unfolded condition. Moving from left to right in  
19 the illustration of unfolded fourth embodiment 32 in Fig. 16, one first encounters web member  
20 10 with three fastener holes, the bottommost of which is designated by the number 14b. To the  
21 right of web member 10, one next encounters rearwardly extending second end 6, with one  
22 centrally positioned fastener hole 14a. The bottom surface 30 of fourth embodiment 32 is  
23 situated to the right of rearwardly extending second end 6 and contains two fastener holes 14a1  
24 and 14c. The upper surface of wedge 8 extends to the right of bottom surface 30 and has no  
25 fasteners holes 14. The remaining two sections of fourth embodiment 32 having centered  
26 fastener holes 14b1 and 14c1 are unnumbered and are reinforcement members for wedge 8, the



1 one which contains fastener hole 14b1 forming a vertically extending back wall of wedge 8  
2 during use. Thus, when fully formed, the structure of wedge 8 in the fourth embodiment would  
3 comprise open sides, a double layer of vertical support at its taller end, a partially doubled bottom  
4 surface 30, and aligned fastener holes 14b, 14b1, 14c, and 14c1 that would allow a fastener, such  
5 as fastener 34 in Fig. 19 to pass through both layers at the taller end of wedge 8, exit through  
6 both layers forming the bottom surface 30 of wedge 8, and enter the top chord of the standard  
7 roof truss 18 upon which the fourth embodiment 32 is supported during use. To fold fourth  
8 embodiment 32 into its usable configuration, the lower end of web member 10 is brought into  
9 contact with bottom surface 30 so that fastener holes 14a and 14a1 become aligned to form  
10 second end 6. As this occurs, rearwardly extending second end 6 becomes superimposed upon a  
11 portion of bottom surface 30. In a separate step, the opposing end on fourth embodiment 32 is  
12 folded to form wedge 8, with fastener hole 14b1 becoming aligned with fastener hole 14b in the  
13 lower end of web member 10, and fastener hole 14c1 becoming aligned with fastener hole 14c in  
14 bottom surface 30. Arrows in Figs. 13 and 14 show the directions of folding. Thus, it is  
15 contemplated for four fasteners, such as fastener 34 in Fig. 19 that is configured as a nail, to be  
16 used for securing fourth embodiment 32 in place during use. A first fastener 34 would extend  
17 through two fastener holes, 14a and 14a1 to connect second end 6 to the downwardly extending  
18 portion of the top chord of a standard roof truss 18. A second fastener 34 would extend through  
19 two fastener holes, 14b and 14b1, further extend through wedge 8, and then finally through two  
20 additional fastener holes, 14c1 and 14c to connect web member 10 and wedge 8 to the top chord  
21 of the same standard roof truss 18. The final two nails 34 would each extend through a different  
22 one of the upper fastener holes 14 in web member 10 to connect web member 10 to the vertically  
23 extending side of valley truss 16 facing second end 6. Fourth embodiment 32 has the simplest  
24 construction, and would produce the least material waste during manufacture. It is contemplated  
25 for wedge 8 to be manufactured with varying pitch, depending upon the application, and for  
26 fourth embodiment 32 to be made from rigid material, such as steel, plastic, nylon, and have a

1 substantially uniform thickness. As an alternative to folded construction, a molded embodiment  
2 similar to that shown in Figs. 15 and 19 is also considered to be within the scope of the present  
3 invention, and which would preferably have a solid wedge 8, as well as a fastener hole 14  
4 through wedge 8 in a similar position to that shown for fastener 34 in Fig. 19. Although not  
5 limited thereto, such a molded embodiment could be made from plastic material, such as  
6 polycarbonate. Fig. 17 shows fourth embodiment 32 connected between a vertically extending  
7 piece of construction material 20 with a non-beveled bottom end 22, and the top chord of a  
8 standard manufactured wood roof truss 18, while Fig. 18 shows forth embodiment 32 connected  
9 between a non-beveled horizontally extending bottom chord of a manufactured valley truss 16  
10 and the top chord of a standard manufactured wood roof truss 18. Although the upper surface 28  
11 of wedge 8 is not marked in Fig. 17 or Fig. 18 for clarity of illustration, both Figs 17 and 18 show  
12 upper wedge surface 28 positioned entirely under the superimposed construction material,  
13 vertically extending piece of construction material 20 or manufactured valley truss 16,  
14 respectively. Fig. 20 shows several present invention uplift resistance straps, such as fourth  
15 embodiments 32, each connected between the horizontally extending bottom chord of a  
16 manufactured valley truss 16 and the top chord of a standard roof truss 18. In the center of Fig.  
17 20, one can see four valley trusses 16 supported by varying numbers of fourth embodiments 32,  
18 determined according to length and supported upon standard roof trusses 18 bearing  
19 perpendicular thereto. In the lower right portion of Fig. 20, three standard roof trusses 18, this  
20 time parallel to the four valley trusses 16, are separated from the valley trusses by a girder truss  
21 36. As shown in Fig. 20, the web members 10 of fourth embodiments 32 are only secured on the  
22 vertically extending side of valley trusses 16 facing the downwardly extending ends of standard  
23 roof trusses 18. It is contemplated that the web members 10 of the second embodiments 24, the  
24 third embodiments 26, and the first embodiments 2 would also be connected to the sides of  
25 valley trusses 16 the downwardly extending ends of standard roof trusses 18, with the  
26 bottommost fastener hole 14b of fourth embodiments 32 being used with a fastener 34 that

1 extends into the top chord of a supporting standard roof truss 18 and thereby connects web  
2 member 10 and wedge 8 to the supporting standard roof truss 18. The two top fastener holes 14  
3 are used to secure web 10 to a vertically extending surface of valley truss 16, while the valley  
4 truss is levelly supported upon the top surface 28 of wedge 8, the slant of the bottom surface 30  
5 of fourth embodiment 32, as determined by angle 12, complements the incline of the standard  
6 roof trusses 18 to place top surface 28 in a substantially horizontally extending orientation.

7 Fig. 21 shows a fifth preferred embodiment of the present invention, similar in  
8 configuration to that shown in Fig. 15 and having a molded construction. Fig. 21 is different  
9 from the fourth embodiment shown in Fig. 15 and 19 only in that the middle fastener hole 14 in  
10 Fig. 15 is not aligned with the top and bottom fastener holes 14 on web 10, and the fastener hole  
11 14 through the bottom of wedge 8 is visible in Fig. 15, and not Fig. 21. The fourth embodiment  
12 32 shown in Fig. 21 also has a second end 6 and web 10 having a greater thickness dimension  
13 than that shown in Fig. 15, none of which are critical differences. Figs. 21 and 19 both show a  
14 fastener 34 extending into the rear surface of web 10, through wedge 8, and beyond the bottom  
15 surface 30 of wedge 8. Angle 12 varies according to the pitch established for the roof  
16 construction formed by the standard roof trusses 18 supporting valley trusses 16, so that the  
17 bottom surfaces 22 of the valley trusses 16 are always supported by top surface 28 in a level  
18 orientation.

19

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Examiner Name	CHRISTY M. GREEN
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3 teeth prevent the two parts 1 and 1' being separated in the opposite direction. Without any cable between the two parts 1 and 1', there is nothing to prevent them being pulled apart laterally, that is, parallel to the direction of the ratchet teeth, thereby disassembling the clamp. However, when tightened about a cable 40 or the like extending through the aperture 30, the cable will prevent the two yokes 10 and 10' being displaced laterally. The bars 11 and 11' could be arranged to enable their excess length to be broken off when the clamp is closed. This could be achieved by making the bars of a frangible material or by having several regions of reduced thickness spaced along the length of the bars to provide locations at which the bars can be broken.

In use, the clamp can be assembled onto a cable 40 by threading an end of the cable through the aperture 30 while the clamp is in an expanded state, as shown in FIG. 1. Alternatively, where it is inconvenient to access an end of the cable, the clamp can be assembled on the cable by taking its two separate parts 1 and 1' and joining them together about the cable. The clamp is tightened initially by finger pressure and is then fully tightened by squeezing the two parts 1 and 1' together with pliers, by gripping the central arched portions 12 and 12' of the yokes 10 and 10' between the jaws of the pliers and squeezing them together. Once fully fastened in this way, the clamp can only be removed by cutting. If, however, a removable clamp is required, it could be made from a softer plastics that enables the yoke 10 to be bent when a ratchet arm 11 is pulled laterally out of the gap 17 between the two arms 15 and 16.

The clamp can be used on a relatively wide range of cable sizes compared with previous clamps because of the large range of sizes of the aperture 30. The clamp is easily assembled and can be used on cables where it is not possible to access an end for threading through the clamp. The clamp can be made readily at low cost.

The clamp is primarily intended for use in electrical connectors, to be fastened onto a cable within the connector housing close to entrance to the housing through which the cable extends. This helps relieve external strain applied to the cable and prevents it being communicated to cable interconnections within the housing. The clamp could, however, be used to retain together a bundle of cables, wires, hoses, ropes or the like, or to attach items to a cable or to other elongate members.

Various modifications are possible. For example, instead of making the clamp from plastics it could be made from an alternative material, such as metal.

The two parts of the clamp need not be identical, as shown in FIG. 3, the two ratchet bars 111 could be provided on the same yoke 110, the other yoke 112 being bifurcated at both ends 113 and 114 to form two gaps 115 and 116 in which the ratchet bars are received.

The two parts of the clamp could be integral with cooperating parts of a connector or the like. As shown in FIG. 4,

one half 41 of a connector backshell housing 40 has two projecting ratchet arms 42 and the other half has two cooperating apertures 44 formed with ratchet teeth, which engage teeth on the ratchet arms. This arrangement reduces the need for a clamp separate from the backshell.

It will be appreciated that the clamp of the present invention could be modified in various ways. The ratchet bars and teeth, for example, could be any form of slider that allows movement in one direction but resists it in the opposite direction.

What we claim is:

1. A clamp for fastening about an elongate member, the clamp comprising: first and second yokes that can be urged together about opposite sides of said elongate member; two generally parallel ratchet bars, said ratchet bars extending between said yokes; and cooperating ratchet teeth extending transversely of said elongate member, said teeth being arranged so that as said two yokes are moved together in one direction said two ratchet bars move over said ratchet teeth to restrain said yokes against separation in an opposite direction.

2. A clamp according to claim 1, wherein said yoke has two arms extending laterally of the clamp, and wherein said ratchet teeth are provided on a surface between said two arms.

3. A clamp according to claim 1, wherein each said yoke has an arched section for receiving said elongate member.

4. A clamp according to claim 1, wherein said first yoke is provided with both said ratchet bars and said second yoke is provided with two sets of cooperating ratchet teeth.

5. A clamp according to claim 1, wherein said ratchet bars have ratchet teeth on two opposite surfaces.

6. A clamp according to claim 1, wherein said yokes and said ratchet bars are moulded from a plastics material.

7. A clamp according to claim 1 for clamping about one or more cables, and wherein said yokes are formed integral with cooperating housing parts of a connector.

8. A clamp according to claim 1, wherein each said yoke is formed integrally at one end with a respective one of said ratchet bars and at an opposite end with ratchet teeth arranged to cooperate with the other said ratchet bar.

9. A clamp according to claim 8, wherein each said yoke with its respective ratchet bar is identical with the other.

10. A clamp comprising: first and second cooperating connector housing parts, wherein said first and second housing parts include two ratchet bars arranged to extend parallel with one another and two cooperating apertures arranged to receive respective ones of the ratchet bars such that a cable can be located between the ratchet bars and the connector parts can be clamped about the cable by pushing the ratchet bars along their length in respective apertures, and wherein said ratchet bars have teeth arranged to extend transversely of said cable.

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(12) **United States Patent**  
LaCoy et al.

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## (54) CLAMPS

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(73) Assignee: **Smiths Group PLC**, London (GB)

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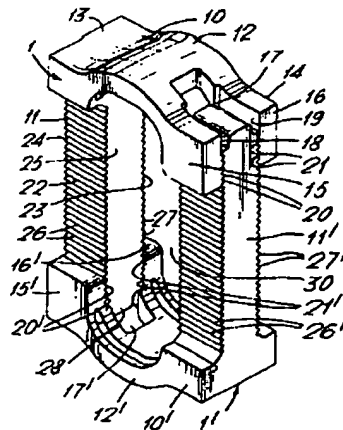
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(57) **ABSTRACT**

A cable clamp has two identical moulded components that can be clamped together about a cable. Each component has a yoke with a ratchet bar at one end and two short arms at its opposite end spaced by a gap and having ratchet teeth on their inner faces. The ratchet bars on each component extend in the gap between the arms on the other component and the cable extends through the aperture between the two yokes and between the two ratchet bars. The yokes can be squeezed together about the cable, causing the ratchet bars to slide over the engaging teeth, which prevents the two components being subsequently separated.

10 Claims, 3 Drawing Sheets



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5 follow the curl 33 by surface tension and to fall into the gutter 19, even if the water results from a heavy down-pour.

FIG. 4 shows a section of a roof with the gutter 19 along one edge. The reference numerals used in FIG. 4 are the same as those used in FIGS. 1-3. The cover 32 may be made as long as necessary, and can either be performed, for example of plastic or sheet metal, such as aluminum or galvanized steel, or it may be made by on-the-job mechanism similar to that used in forming some gutters out of flat sheet aluminum. However, it is convenient to make the cover 32 in standardized shorter lengths. Cover sections about 1.5 m long have been found to be quite satisfactory. Thus, in FIG. 4 there are portions of two covers 32a and 32b. The cover portion 32a is held in place by two straps 38a and 38b. One of the connectors 37 holds the ends of the cover sections 32a and 32b in alignment.

FIG. 4 also shows that most of the open space of the gutter 19 is covered by the covers 32a and 32b. The small, remaining slot between the lip 25 and the adjacent edge of the covers 32a and 32b is less than 10% of the normal open area. The covers 32a and 32b extend over at least about 90% of the normally open area and preferably over about 97%.

FIG. 5 shows one of the connectors 37 as having a small tab about 0.3 cm wide about 0.3 cm from one edge to provide a small space between adjacent ends of the cover sections 32a and 32b. While the connector 37 is handy to hold adjacent ends of two cover sections 32a and 32b in alignment, other connecting means may be used.

FIG. 6 shows a modified cover 46 generally similar to the cover 32 of FIG. 1 except that it has a flap 47 bent downwardly at the end. This flap, covers a triangular opening (indicated by reference number 48 in FIG. 1) that would be large enough to admit birds into the space under the cover 32 in FIG. 1. The opening could also admit some rain and some of the debris that the cover is intended to keep out. The flap 47 at each end of the gutter extends down far enough to overlap the end of a rake molding 49 and perhaps part of a rake board 50 that covers the upper edge of the siding 51. The flap 47 could be formed as an L-shaped separate member or each flap could be made at one end of some of the standard cover members at the same time the curl 33 was formed. Alternatively, the curl 33 could be formed to the end of a cover member 46 and then a part of the cover member, including the end of the curl 33, could be cut away to leave a flat part of the member 46 that could then be bent down to form the flap 47.

The embodiment in FIG. 6 shows a different, standard support 52 to hold the gutter in place on the fascia 11. The generally U-shaped support 52 is formed to fit around the outside of the gutter 19 to replace the spikes 29 in FIG. 1. Without spikes to rest on, the curl 33 would droop into the gutter but, in accordance with one of the spacing means of this invention, is prevented from doing so by clips 53 spaced along the cover 46 in the same way that the straps 39a-39c in FIG. 4 are spaced along the cover 32.

Each of the clips 53 is about 1 cm to 2 cm long as measured in the longitudinal direction of the gutter 19 and is formed so that it has a first pair of jaws 54 and 56 shaped to grasp the curl 33 and a second pair of jaws 57 and 58 to grasp the inwardly turned lip 25 with the reverse-bent edge 59. The jaws 54, 56 and 57, 58 face in opposite directions and, in this embodiment, are formed

6 of a single strip of sheet metal. The respective pairs of jaws are spaced from each other so that they hold the curl 33 and the inwardly turned lip 25 the same distance apart as the strap 39 in FIG. 1 does. Furthermore, they grasp the curl and the lip tightly enough to prevent the outer edge of the cover 46 on which the curl is formed from drooping into the gutter 19.

FIG. 7 shows a modified embodiment 60 of the clip 53 of FIG. 6. The clip 60 can be extruded or molded or stamped out of sufficiently rigid stock. In this embodiment, it is stamped out of sufficiently rigid metal or plastic, such as, for example, a sheet of rigid aluminum alloy about 0.3 cm thick, although it may be desirable to make it thicker or thinner. The clip 60 is shown as having a pair of jaws 61 and 62 that engage the curl 33 and preferably have a matching curvature. The opposite edge of the clip 60 engages the outer part of the gutter 19 to maintain the required spacing between the curl 33 and the gutter, and it is convenient for that edge of the clip to have another pair of jaws 63 and 64 to fit the edge part of the gutter 19. In this embodiment, the jaws 63 and 64 fit over the inwardly turned lip 25, and the lower jaw has an outer end 66 that substantially conforms to the inwardly facing surface of the vertical portion 24 of the gutter 19. The fact that the lower corner of the jaw 64 engages the portion 24 relatively far from the inwardly turned lip 25 stabilizes the clip 60 and prevents it from rotating counterclockwise (as seen in FIG. 7) in response to downward pressure of the cover 32. In fact, the clip 60 holds the covers 32a and 32b in FIG. 4 in place so, well that connectors 37 between proximal ends may be eliminated.

What is claimed is:

1. A protective structure for installation over a gutter structure attached to a building having a sloping roof comprising sheathing and roofing material over the sheathing, the gutter structure comprising an elongated gutter having a generally U-shaped cross-section including upwardly extending inner and outer sides and being attached to the building adjacent to and slightly lower than the lower edge of the roof to receive water run-off therefrom, the protective structure comprising:

a cover comprising an elongated, solid sheet having two parallel longitudinal edges, one of the longitudinal edges extending under at least a lower edge of the roofing material, the other one of the longitudinal edges formed with a curl, the cover extending downwardly and outwardly from the lowermost edge of the roof, with the curl extending downward toward the gutter, and the cover extending over at least approximately 90% of the open width of the gutter but with the edge containing the curl spaced from the outer side of the gutter by a distance of at least approximately 0.3 cm; and

a plurality of spacer members disposable at a distance from one another along the outer edge of the sheet, each of the spacer members comprising engaging means for controlling the spacing between the outer edge of the sheet and the outer side of the gutter, the engaging means including a first part curved to fit at least partially around the curl at the outer edge of the sheet and a second part shaped to engage the outer side of the gutter, the first part of the engaging means being spaced, in a direction toward the inner side of the gutter, from the second part by a distance determined at least partially by the desired distance between the outer edge of the sheet and the outer side of the gutter, whereby said

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## United States Patent [19]

Elko et al.

[11] 4,455,791

[43] Jun. 26, 1984

## [34] PROTECTIVE COVER FOR GUTTERS

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[22] Filed: Jun. 10, 1982

## Related U.S. Application Data

[63] Continuation-in-part of Ser. No. 272,209, Jun. 10, 1981, abandoned.

[51] Int. Cl.<sup>3</sup> ..... E04D 13/04

[52] U.S. Cl. .... 52/12

[58] Field of Search ..... 52/12, 11

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[57]

## ABSTRACT

A protective structure for a gutter includes an elongated, impervious sheet wide enough to extend across at least about 90% of the width of the gutter and up under a lower edge of roofing material. The outer edge of the cover curls downwardly and the water follows the curvature by surface tension to cascade into the gutter. The cover may be held in place by straps that extend transversely across it and have one end engaged under the inwardly turned lip of the gutter and the other end engaged under the roofing material. Alternatively, clips may connect the curl to the inwardly turned lip of the gutter. Flanges extending downwardly from the ends of the gutter block off openings there.

15 Claims, 7 Drawing Figures

